THE IRON AGE

New York, November 15, 1917

ESTABLISHED 1855 VOL. 100: No. 20

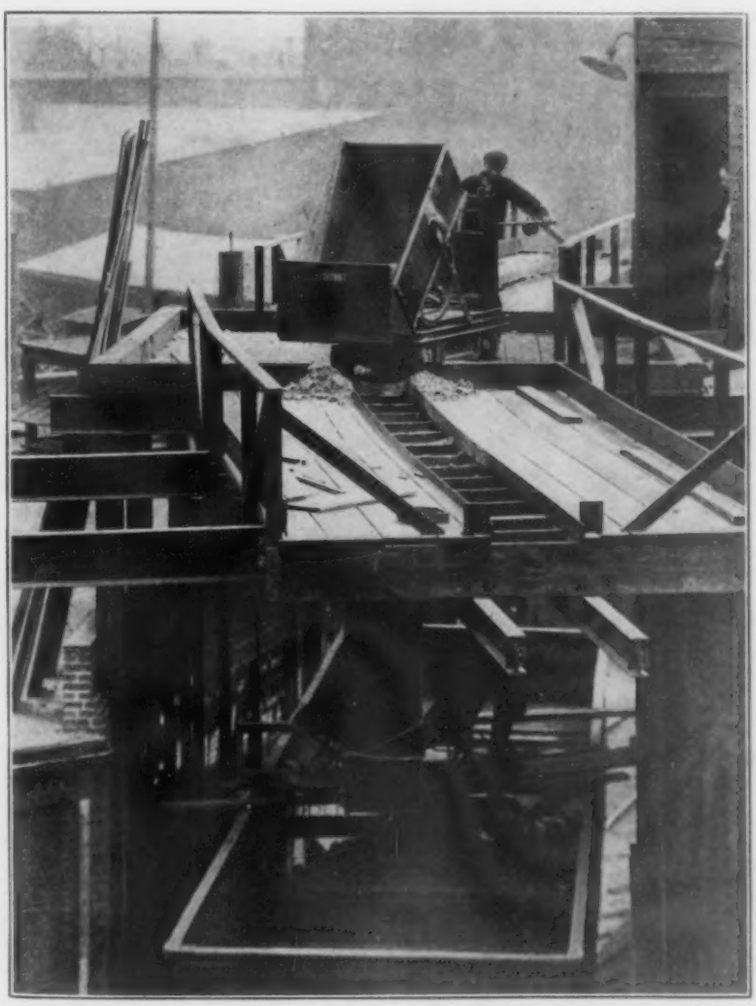
Handling the Refuse of a Foundry

Conservation of Labor Secured at Chisholm-Moore Plant by Installing an Elevator and Trestle for Dump Body Truck

THE conservation of labor in these days of high wages and scarcity of workmen is of more importance to plant managers than ever before, and the special application of modern equipment often proves a great aid in saving labor and consequently in cutting down operating costs. A new method of handling old sand, cores, cinders, etc., in a malleable iron foundry by which the cost of removing refuse has been materially reduced, was recently adopted by the Chisholm-Moore Mfg. Co., Cleveland.

Formerly workmen hauled the refuse from the foundry up an incline in wheelbarrows and dumped it into railroad cars. As the foundry produces about four cars of this refuse a week, the labor cost of wheeling it to the cars was not a small item. To eliminate this hand hauling in wheel barrows from the foundry floor and up the incline to cars, a 2-ton elevator was installed on one side of the plant adjoining the railroad siding and a platform covered trestle was erected over the railroad track. Refuse is now gathered up in an electric storage battery truck with a dump body, taken up the elevator and onto the trestle and dumped into hopper cars beneath. The trestle is built of steel and is 22 ft. 6 in. in height. Near the center is a platform connected with the building and elevator entrance, this platform being large enough to permit a truck to turn and run in either direction on the trestle. Each end of the trestle is somewhat longer than the length of a car so that there is ample room for spotting cars on the siding beneath.

A guide track for the truck is provided by 3 x 4-in. angles laid on the trestle, these being 2 ft. apart and coming to a point at the platform end so that the truck guides itself over either section of the trestle. Openings are provided in the trestle platform beneath the guide rails through which the refuse is dumped into a sheet-steel hopper under each end of the trestle. The hopper is 20 x 48 in. at the top and tapers down to 20 in. square at the bottom. It is movable and extends down to just above the top of the car beneath, being attached to a standard hoist carrier that runs on an I-beam track under the truck runway. Only the two outside wheels of the carrier are used, the inside ones having been removed. The hopper is also hinged so that it can be lifted up lengthways out of the way when a box car is run under the track beneath.



Foundry Refuse Is Collected by a Dump Body Storage Battery Truck Which is Brought Up on an Elevator to the Trestle and Dumped Into the Cars Beneath. The wheelbarrows on top of the car show the old way of handling spent sand, cores, cinders, etc.

The dump body of the truck is 59 in. long, 36 in. wide and 23 in. high. This body is removable, and in its place can be substituted a wooden platform for use in han-

A 4000-Lb. Dump Body Truck in Addition to Collecting Refuse Is Also Employed for Handling Small Castings and New Sand, While by Removing the Dump Body and Substituting a Platform It Becomes a General Utility Conveyor Around the Plant

dling large castings and other material. By adapting the truck for various uses it becomes a general utility conveyor around the plant in addition to handling castings and new sand, and is kept in almost constant use. The dump-body truck is found very convenient in handling small castings. When used for this purpose the end gate is lowered, the castings are shoveled into the hopper from the end, and the whole load is dumped after reaching its destination.

The truck is a standard four-wheel steer type, built by the Elwell-Parker Electric Co., Cleveland, with the hopper body as added equipment. It has a single reduction worm drive. The wheelbase is 67¼ in., and the wheels have solid rubber tires. The truck has a capacity of 4000 lb. The hopper is balanced on rockers on each side, so that its dumping requires no energy on the part of the operator further than overcoming the friction of the mechanism.

Steel Distribution Committee

The steel distribution committee of the American Iron and Steel Institute, which acts as intermediary between the Government and the steel manufacturers in the allotment of Government requirements of steel, is now constituted as follows: J. A. Farrell, United States Steel Corporation, chairman; J. B. Bonner, Carnegie Steel Co., vice-chairman; E. A. S. Clarke, president Lackawanna Steel Co.; J. A. Topping, chairman Republic Iron & Steel Co.; F. J. Hall, vice-president Central Iron & Steel Co., Harrisburg, Pa.; H. F. Holloway, Jones & Laughlin Steel Co.; J. Ogden Hoffman, Brier Hill Steel Co. Mr. Holloway is New York representative of his company but has been for several months also in charge of the Washington office. Mr. Hoffman represents his company at Philadelphia, but of late has been giving special attention to its Washington business.

Two of the six blast furnaces of the Youngstown Sheet & Tube Co. are idle. One of the Hubbard furnaces has been blown out for relining and repairs. One of the Youngstown stacks has been banked for lack of coke. Unless the coke supply soon improves it is probable another Youngstown stack will have to be banked.

AMERICAN MERCHANT MARINE

National Foreign Trade Council Submits Important Report

WASHINGTON, Nov. 12.—In a report and resolution submitted to the United States Shipping Board to-day, the National Foreign Trade Council addresses itself to the question of the national policy necessary to render permanent the rehabilitation of the American Merchant Marine which it regards as about to be practically accomplished through the execution of the present construction and requisition program of the Shipping Board. The report was prepared by the council's committee on Merchant Marine, and is signed by James A. Farrell, chairman of the council and president of the U. S. Steel Corporation, and P. A. S. Franklin, president of the International Mercantile Marine Company. Edward N. Hurley, chairman of the Shipping Board, is a member of the council.

The resolution of the council submitting this report to the Shipping Board declares "that the removal of all inequalities and injustices from the American navigation system, enabling American shipping to maintain itself upon an equitably competitive basis with other nations, with due regard to American standards of living and compensation, is absolutely essential to the permanency of the forthcoming rehabilitation of the American merchant marine," and strongly urges "all who are interested in insuring the permanent restoration of the American flag to the recognized place it formerly held in the carrying trade of the world, generously to co-operate with the United States Shipping Board for the purpose of securing the necessary revision and amendment of the navigation laws in time to render effective service in the operation of the new American fleet."

The committee points out that the experience of Great Britain has proved that less than 60 per cent of British foreign trade is carried in British bottoms.

"If the carriage of 60 per cent of American foreign trade in American ships," says the committee, "would render the United States reasonably free from the necessity of employing a foreign merchant marine for its carrying trade, the program of the Shipping Board and Emergency Fleet Corporation at present under execution would accomplish the desired result." The committee expressed the conviction that, "whenever the war ends, the restoration of peace will find the United States equipped, or in process of rapid equipment, with a merchant fleet calculated to carry pretty close to the proportion of our own foreign trade that British experience has shown to be normal for the nation with the greatest merchant marine afloat."

"The question, when peace comes, will be of operation rather than of provision of more ships. * * * When the Government comes to sell or charter the vessels of its merchant fleet to private organizations there will be the opportunity to arrange conferences in the different trades, which will establish rates in harmony with costs of operation and at levels which will encourage the growth of American trade with all markets, fair to both shipper and ship owner; control tonnage, insuring a sufficient supply for all requirements; and in general effect and maintain a standardization of conditions that will make for the successful operation of the rehabilitated American merchant marine. At the same time sufficient supervision of foreign bottoms may be maintained through control of clearance and by other means to prevent undue advantage to foreign ships with regard to American commerce."

The United States Metal Refining Co., which has a large plant at Chrome, N. J., has purchased a tract of about 120 acres on Tuffts Neck, Carteret, N. J., from the International Nickel Co. It is estimated that the value of land is about $1,200,000. The new site will probably be used ultimately for a plant for the metal refining company, which is cramped for lack of room to expand in its present location.

FIXED IRON AND STEEL PRICES

Views of Consumers on Agreements Between Government and Makers

A canvass of views of consumers of iron and steel on the fixed-price policy instituted by the Government brings out a general reply that too little experience has yet been had by the average user to make any lasting comment, let alone drawing conclusions as to the effect. This comes partly out of the custom of buyers to enter a market for tonnage purchases at relatively long periods and hence numbers of THE IRON AGE readers have not, as the phrase goes, tested the market. Some of the opinions and some of the incidents may, however, be here recorded, and they have a relation to the suggested abrogation of contracts likely to be considered in the Pomerene price-fixing bill, scheduled to come up for consideration at the next session of Congress. Quotations from replies are as follows:

A steel casting company: The Government fixed price policy will be of great benefit in the organization of the country for war, for the reason that prices had absolutely run wild and were being made with no regard whatever to production costs, the high prices maintaining being largely the result of competitive buying for future unknown requirements. The prices fixed must show a fair profit to all manufacturers engaged, and with a graduated apportionment of the steel production in the United States to purposes requiring this steel for the prosecution of the war they will more speedily accomplish the national end than any other policy that could be adopted. It naturally will work many hardships, but all those combined will not approximate the benefit derived by the country as a whole. In our own company orders or inquiries for non-war purposes are receiving no consideration, for the war needs are so stupendous that they will tax the resources of the entire steel production in the United States.

A selling agent for various steel makers' products: As we see it the prices are not such as to warrant increased production, and are a distinct hardship on those of us who are not self-sustaining throughout.

An iron, steel and fuel broker: We are really somewhat surprised that such a radical change in the mode of doing business in this industry is accompanied with as little confusion as has been the case. One of the particularly good results has been to put the purchasing agent in a more secure position. The condition that is at present causing the most confusion both to the small mills and the small consumers is what is the position of a warehouse. The larger producers refuse to quote on their product for mill shipment, but do take on business through their own warehouse or through closely allied warehouses not at 2.90c., 3c. and 3.25c. per lb. but at 4.50c., 5c. and 7c. per lb. This procedure is considered by the smaller mills more or less of a subterfuge. They feel that their interests have not been particularly looked after or themselves consulted in arriving at the fixed prices but face the penalty of being considered slackers or at least unpatriotic if they do not observe the conditions laid out for them.

A maker of cold-rolled strip steel: We had hoped that the Government would not find it necessary to try to fix prices for other than the war business. Conditions, however, were so unusual that it was no doubt warranted in taking a very unusual step. Either price-fixing should have been pursued far enough to affect the products that are bought by the people or it should not have been adopted; but that will not prevent me from doing everything in my power to uphold the hands of and co-operate in every way with the Government in its action.

A maker of electrical machinery: It seems quite generally a condition that all manufacturers have good stocks and are covered for replenishments under existing contracts at almost the highest prices, which will carry them over into next year. Therefore, there are not many buyers, and the steel industry, having their order books loaded with such business, are kept busy without booking any new contracts at Government prices. I realize that as time passes and old contracts are cleared up, we can all have more definite views on the question of how the Government's fixed price policy is working.

A machine tool manufacturer: The whole subject is too young yet and serious to bear our signature. We do not mind giving you a few of our experiences, however. Take it on the matter of coke (and we had some 15 cars ordered on a contract at "price prevailing at time of shipment"). When the Government set the price, the coke people refused to bill at $6, and therefore they are shipping us coke at $15. For self-protection, for future use, we ordered some 15 cars of coke at a price of $15. As we understand matters, contracts are to stand; therefore, we are out $9 a ton until we finish the contract.

The only way that we can buy steel is to pick it up of a jobber, and as the Government has not set the price with the jobber, we have not found any difference on the price of steel.

As for pig iron, we had contracts running up to, say, $42, and yet the Government put the "stop" price in at $33. Now we are having some iron come at $30, therefore we are making $3 a ton. When we get to using the $40 iron we shall be losing $7 a ton. Of course, as far as the matter of abrogation of contracts is concerned, the user will get the best of it in general as most of the low price stuff is already delivered. We think the pig iron people are handling this matter in the most patriotic manner, and we have had iron offered to us for delivery into next year at Government prices. As for steel and coke, we cannot say as much.

We might mention that a few days ago we placed an order for some machinery spindle steel and they held us up to some 10c. a pound, while according to the new Government price, it ought to be down to 6c. or 7c. a pound at the most. This was an order placed direct with the mill, and yet, we are not getting the advantage of the new price. We have not yet mentioned that we are making machine tools for the Government, but if matters do not adjust themselves shortly we shall have to do so, and perhaps resort to a priority demand.

A maker of heating and ventilating equipment: The fixing of a maximum price for iron and steel by the Government is a good thing. It will operate to prevent speculation and over-buying and thus stabilize the market.

A maker of bar iron: My observation is that in some lines there has been some increase in buying, but generally domestic purchases of finished materials have largely decreased, and this, it seems to me, will remain until old contracts are cleared up.

A maker of bolts and nuts: We are in entire accord with the idea that no one should make an undue profit under present conditions. Every one should do something in the way of making a sacrifice. Some of us can make a sacrifice by enlisting and going to the front; others by selling their product at materially lower prices than the natural law of supply and demand would indicate. Hence, where manufacturers or producers are not willing, voluntarily to make what seems to us fair and reasonable prices, it is necessary for the Government to step in and arrange for price fixing. As an economic proposition, this is a difficult and frequently unwise thing to do, but we are confronted with abnormal conditions and must conform to them.

A maker of washers: Any move, whether by the Government or brought about by market conditions generally, which involves radical price changes, has a bad effect on business at any time. Of course, in these abnormal times business adjusts itself to these changes without any apparent serious results. Price fixing by the Government is a blessing because it gets us nearer the ground floor to which all of us will have to get when the proper time comes. As to the abrogation of contracts I hope that our legislators will have the good sense to let well enough alone. Very few will be seriously hurt by conditions as they are. Surely it is difficult enough for the manufacturers to get a contract to hold water when conditions are not favorable, and I do not consider that these tendencies need the Government's approval, by making it a party to it.

A maker of wire cloth: We do not object to the Government's fixing fair and reasonable prices for its purchases of steel products for its own use and that of our allies. We do object to their obliging us to adopt these prices for all other business, as this eliminates what should govern prices—supply and demand.

A maker of horse shoes, etc.: The establishment of fixed prices by the Government will have a good effect. It will more or less influence the trade in specifying for their immediate wants; they have failed to do recently, owing to the uncertainty of what was to be done. We have made no changes in our prices, nor do we contemplate making any, due to the fact that the only advances made were those due to increased cost, and in considering this we hardly covered ourselves.

Speeding Up Shipbuilding Program

Charles A. Piez, President Link-Belt Co., Takes Active Charge and Bureaucratic Methods Are to Be Abandoned—Conscription of Labor May Come

WASHINGTON, Nov. 13.—The Emergency Fleet Corporation of the United States Shipping Board has again undergone a radical reorganization as a result of which Admiral Capps, its general manager, though retaining the title of the office, has been displaced so far as responsible duties are concerned by Charles A. Piez, president of the Link-Belt Co. of Chicago, who, a fortnight ago, was induced to come to Washington to assist Chairman Hurley of the Shipping Board in his efforts to speed up the shipbuilding program. Mr. Piez is an engineer of wide experience and is already securing results through the slashing of red tape and the substitution of up-to-date business methods for the complicated and bureaucratic systems of the Navy Department under which the Fleet Corporation has been operated since the resignation of General Goethals.

The appointment of Mr. Piez as the active executive of the Fleet Corporation was but the first step in its reorganization. Several naval officers who heretofore have been assisting Admiral Capps have been relieved from this duty, and their places have been taken by engineers of broad business experience. Charles Day of Philadelphia, a mechanical engineer who has supervised much important construction work, has been assigned to the direction of the three big Government owned shipyards in which fabricated steel ships are to be built. Mr. Day was retained by the Shipping Board several weeks ago to make a study of the shipbuilding plants of Great Britain and is now in England with the American War Commission for that purpose. James Heyworth, a Chicago contractor, who has a comprehensive knowledge of the lumber industry, has been placed in charge of wooden shipbuilding and will devote himself to hastening this feature of the board's program which of late has been lagging in very discouraging fashion. A. J. Mason of Chicago, another well known engineer, has been placed in charge of the inspection division of the Fleet Corporation, and will organize a staff whose duty it will be not only to see that all contract work is executed in first-class manner, but also to keep the Shipping Board fully advised as to progress in all departments in order that no feature of the work may fall behind. Mr. Mason will institute a system of progress reports which will keep the board informed from week to week of the exact status of every ship in process of construction.

Change Was Expected

The latest upheaval in the Shipping Board has been foreshadowed for some time. While Admiral Capps' accomplishments have at all times been fully recognized, the most experienced observers here familiar with Navy Department methods have, from the outset, felt that the placing at the head of the Emergency Fleet Corporation of a naval constructor imbued with the traditions of the Navy Department was a serious mistake. The systems employed in the department were instituted many years ago and are in no way adapted to expeditious work. In the matter of designing, drafting specifications, and in other technical details of shipbuilding, the Naval Bureau of Construction and Repair is believed to be equal, if not superior, to that of any European Government, not excepting Great Britain; but its circumlocution methods have been such as to preclude a genuine speeding up of the Shipping Board's building program, and Chairman Hurley and his associates were some time ago reluctantly forced to the conclusion that a sweeping change must be made. A committee of experienced engineers and business men was, therefore, appointed to make a thorough examination of the organization and methods of the Fleet Corporation and to recommend such changes as seemed desirable. This committee was headed by Mr. Piez and included Mr. Mason, Mr. Day and Frank Kirby, a well known New York engineer.

New Men and Methods Needed

The report of the special committee, which was received by the board a few days ago, left no doubt in the minds of Chairman Hurley and his associates that new men and new methods must be immediately employed to save the situation. The board found that in place of a harmonious feeling between shipbuilders and the officials of the Fleet Corporation a spirit of antagonism had developed between the contractors and the members of Admiral Capps' staff, and that builders were being hampered and retarded in their efforts by the bureaucratic routine prescribed by the manager of the Fleet Corporation, which made it impossible to secure information promptly or to keep in touch with the corporation's plans. Many complaints were made, it is said, by contractors that their plans and specifications were changed from time to time and that their work was held up for considerable periods pending changes which might easily have been promptly authorized.

The special committee recommended the substitution of up-to-date business methods and modern engineering practice for the system employed by the Fleet Corporation, and especially that the Washington headquarters be brought into close co-operation with the men who are building the big emergency fleet. The raw-material situation was also dwelt upon by the special committee, which found that the lumber contractors, and especially those who have agreed to deliver Southern white pine, are heavily in arrears. There are now 310 wooden ships building for the Fleet Corporation, and as a result of the reorganization Douglas fir will be substituted for pine and distributed to the Atlantic and Pacific seaports under priority orders by special trains that will be given the right of way over all other traffic. It is not known whether the special committee expressed a definite opinion concerning the wisdom of the original determination to build wooden ships, but it has been decided that no more contracts for such vessels shall be let.

Hurley's Stirring Address

Chairman Hurley of the Shipping Board has spent a strenuous fortnight in the effort to expedite the Shipping Board's program. He recently summoned to Washington responsible representatives of the shipyards embraced in the Atlantic Coast Shipbuilders Association, and at an extended conference with them delivered a stirring address, in part as follows:

> This meeting has been called for the single purpose of establishing a new goal for our expectations. Between now and March 1 this country will turn out approximately 1,000,000 tons of ships, deadweight. In the whole of 1916 we turned out little over 750,000. Thus we will achieve in four months far more than we achieved previously in 12 months. Conservatively stated, we have quadrupled our output. The new goal of our expectations is 10 times the production of 1916.
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> We can't achieve this goal by ordinary methods, by normal energy, or average initiative. This is an extraordinary period in the country's history. We are confronted with an abnormal task and must apply abnormal methods. Every ounce of our energy and initiative must be directed toward the achievement of the greatest task ever imposed upon a nation in war.
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> The Government alone, no matter how willing and anxious to do its part, cannot bring the production of ships to the maximum capacity of the country. The shipyards alone, no matter how willing, can't do it. The labor of the country, no matter how intelligent, skillful and patriotic, can't do it. Working together, determined to forget everything but the national welfare, we can achieve the goal we have now set for ourselves.

In any great enterprise of this kind there are always obstacles to be overcome. The biggest and best industrial concern in the world, if suddenly asked to multiply its output by 10, would have to strain every nerve to accomplish the task. It would have to build new plants, find additional foremen, new labor, new machinery, and adopt new methods. If there were no obstacles to be overcome, however, there would be no special credit in the achievement.

I want to take this opportunity to pay a tribute to the patriotism of labor. The shipyard owners probably do not understand the obstacles which the patriotic labor of the country have had to overcome. Labor probably does not understand the obstacles which the shipyard owners have had to overcome. It is so that we may all understand each other better, pull together, and speed up that Admiral Capps and I called this meeting. Incidentally it may give all of you a knowledge of the difficulties which we must overcome here at our own end.

We are going to build 6,000,000 deadweight tons of ships in 1918. I say we are going to do it, rather than that we are going to try to do it, because I know that anything America sets out to do she does. As a fighting Nation, we have a clean record for victory. We've got the men, we've got the money, and we've got a cause that is right.

We want the labor representatives here to tell us the best way to speed up and augment the labor supply. We want the shipyard representatives to tell us what will facilitate the work of production in order that we may reach the goal which we have set for ourselves. It is my hope that to-day will establish a milestone in the progress of America in the war against the German government.

The young Americans in the trenches are offering the supreme sacrifice of their lives for the honor of their country. Their safety and their success depend on us. Much less is required of us, but I am confident that everything we have to give will be given in the same spirit of unselfishness.

Five Recommendations

Following the conference the representatives of the shipbuilders submitted five recommendations, designed to expedite the work of building the enormous fleet projected by the board, as follows:

Adjustment and standardization of shipyard wages on the Atlantic coast, with the co-operation of labor representatives and the moral suasion of the Government.

Distribution among all the shipyards of the visible supply of labor, so there shall be no surplus in one plant and shortage in another.

Arrangement for priority in delivery of materials in a systematic way, which will keep each yard supplied with the material it needs first.

Co-ordination and co-operation of the Navy Department and the United States Shipping Board with the builders.

An equitable policy for the adjustment of unfinished contracts.

Chairman Hurley and his associates were very favorably impressed with these recommendations, and it is probable that they will be incorporated in the Shipping Board's general policy. Concerning the suggestion that an equitable policy for the adjustment of unfinished contracts be adopted, it is explained that this relates to an appeal received from a number of yards in which are being constructed vessels contracted for by private parties but commandeered under an order of the board issued some time ago. The contractors claim that the ships cannot be completed for the contract prices and are petitioning for special allowances to meet the increased cost of production. The commandeered vessels aggregate over one million tons and were contracted for at a time when labor and materials were much cheaper than to-day, some of the orders having been placed early in 1916. The majority of the yards in which these vessels are building are located on the Atlantic coast, and the builders point out that the Government has approved large advances in labor and material costs which have been incurred by yards building war ships on the cost-plus-profit basis. In this way, it is contended, the Government has itself created the condition now complained of. It is probable that the board will meet this situation by increasing the contract prices of vessels where it can be clearly shown that the greater cost is due to bona fide increased expenditures by the contractors.

Complaints Submitted

Complaints were made to the Shipping Board officials by the representatives of several yards that certain shipbuilders are bidding against each other for the services of high class superintendents and that this practice is having a very demoralizing effect. In one case cited, a Pacific coast yard offered a superintendent $50,000 to leave a rival. The British Government, in the Defense of the Realm Act, forbids such practices and it is probable that Congress will be appealed to to enact a similar prohibition.

Labor Situation Discouraging

While the conference of the shipbuilders has served to stimulate them to greater activity and the reorganization of the Fleet Corporation will have an excellent effect, very discouraging reports have reached the Shipping Board within the past two or three days concerning the labor situation. While the United States Shipbuilding Labor Adjustment Board recently announced a uniform minimum wage scale for the Pacific coast shipbuilding yards, providing an increase of 10 to 30 per cent over the old scale, representatives of union labor promptly gave to the press statements declaring that "there won't be many ships built under this scale." M. J. Maguire, representing the Metal Trades Craftsmen of the San Francisco Bay district, is quoted as declaring that "the entire shipbuilding crafts of the Pacific coast will appeal to Wilson against the decision." The adjustment board points out that 75,000 men are necessary on the Pacific coast alone to carry out the Government's program and that on this basis there is a shortage of 30,000 to meet which the Department of Labor will be urged to extend the Federal employment service in California, Oregon and Washington to supplement the union bureaus which are now unable to supply skilled workmen. In promulgating the new scale the board made the following statement:

The shipbuilding labor adjustment board is a war board. The owners of the shipyards are, for the duration of the war, merely agents of the Government. Employers and employees must realize the war has changed their relation to each other. The Government is insistent that ships it requires must be built and be built promptly. It is equally insistent that standards of living must be preserved.

The national program requires an increase in the output of ships from 750,000 tons turned out in 1915, to 6,000,000 tons in 1918. This necessitates introduction, wherever possible, of the two or three shift systems. Immediate steps to bring about this change must be taken by shipyard owners. The board urges representatives of organized labor and employers concerned to work out in co-operation with agents of the Government plans for the more rapid training of skilled workers in the different crafts.

The board did not feel justified in forcing on the taxpayers of the country, who henceforth must pay for the ships built, the higher wage that the consideration of merely local aspects of the situation might have warranted. It urges employers and employees to accept the decision in the spirit of loyal co-operation and do their utmost to help the Government win the war by turning out the ships so urgently required.

The minimum scale for the Pacific coast was fixed by the board as follows:

Journeymen machinists, molders, blacksmiths, anglesmiths, pipe fitters, boilermakers, shipfitters, pressmen, angle and frame setters, riveters, chippers and caulkers, acetylene workers and electrical workers, $5.25 per day; painters and plate hangers, $5; sheet-metal workers, coppersmiths and flange turners, $6; heaters, foundry carpenters, furnace men and punch and shear men, $4.50; pattern makers, $6.50; planer men, counter sinkers, drillers and reamers and holders, $4.20; machinist specialist, $4; rivet heaters, $3.15, and laborers, $3.25. Helpers are divided into two classes, as follows: Machinists, pipe fitters, sheet-metal workers, ship fitters, electrical workers, molders and helpers, $3.60; blacksmiths, coppersmiths, slab, plate hangers, hook tenders, flange fire and machine helpers and casting cleaners, $3.90. In yards where wooden ships are being constructed the minimum rate for caulkers is fixed at $6.50; shipwrights, joiners, boat builders and mill men, $6, and laborers and helpers, $3.25.

The scales of rates are retroactive, and in the Puget Sound district go back to Aug. 1. The board directed that they should be in effect on or before Monday, Nov. 12, and all back pay must be paid within two weeks thereafter. An 8 hr. day is fixed for the San

Francisco and Portland districts, while working conditions in the Puget Sound district are to be determined by agreements between employers and employees.

The labor conditions prevailing in the shipyards are duplicated in several other important industries, notably in the mining of coal, a product upon which every branch of war activity rests. In certain coal mining districts, according to reports received here, the men refuse to work more than 6 hrs. daily, and in some cases they insist upon laying off three days a week. Higher wages, it is said, simply make conditions worse, tempting the men to cut down their hours of labor and increasing drunkenness to a marked extent. Many operators in order to prevent a decrease in production, have met the most unreasonable demands of their men, and in the case of an important anthracite property it is said that the company advanced to the local union the dues of a large number of its men to prevent a hold-up of the work. In one district, by general consent, the companies are regularly paying the union dues of their men and deducting the amounts from their wages.

Coal Miners Are Defiant

Threats made by the fuel administrator, Dr. Garfield, that unless the coal miners in the southwestern districts go to work the Government will use the full powers conferred upon it by law to secure maximum coal production have been met by defiant statements by representatives of the miners' unions to the effect that the Government will prove unable to force the men to work. Representatives of the coal miners who have been in conference with Dr. Garfield during the past week have refused to agree to the insertion in a new wage contract of a provision penalizing strikes and lockouts and, after a secret meeting held here, left for their homes declaring that a general convention of Southwestern miners would be called to meet in Kansas City to discuss the situation.

Ordered to Return to Work

Since the departure of these labor leaders, Dr. Garfield has been advised that Alex Howatt, an official of the United Mine Workers of America, has ordered the striking miners in the Kansas district back to work pending the action of the Kansas City convention, but no details have yet been received as to the extent to which mining operations have been resumed. No less than 60 mines have been idle in Kansas, while the miners in Oklahoma, Arkansas and Missouri are threatening to strike unless they are given immediate wage increases. Dr. Garfield declares that no contracts granting wage advances will be approved by the Government unless the proposed penalty clause is inserted, and he states further that he will not apply to the Southwest the recent raise of 45 cents per ton in coal prices, which was designed to absorb wage increases, until the miners come to terms. In an official statement issued here Dr. Garfield says that the automatic penalty clause must not be made the occasion for oppression, either on the side of the operators or the men, but that "if honest differences arise, they must be threshed out by the representatives without disturbing the operation of the mines."

Indignation Expressed

Administration officials express great indignation at the course pursued by the labor leaders in certain districts, which has heavily handicapped the prosecution of the war. One high Government official, of whom it is said that his "responsibilities require him to see that several million men in certain industries shall remain steadily at work," is quoted as follows:

> I cannot see any certain method of securing steady labor on indispensable war work except by the conscription of workingmen.
>
> The right to strike is incompatible with the duty of the American army in France. The soldiers are under iron military discipline. They cannot strike, but must do as their country requires, even if it takes their lives.
>
> These soldiers cannot be sure of victory unless they are sure of supplies. They cannot be sure of supplies unless there are ships to carry the supplies.
>
> When men here in this country insist upon the right to hold up the building of ships or the manufacture or transportation of necessary war supplies they strike a blow at the American army in France. They not only stand in the way of American victory, but they imperil the lives of our soldiers.
>
> I know the workingmen do this unwittingly, and therefore I do not suggest any harsh measures, but I submit that the present conditions cannot be tolerated long.
>
> What would we think if it were suggested that every one of Gen. Pershing's boys should have the right to quit at any time he pleased, and to combine with other soldiers to strike unless Pershing would grant any concession they might demand?
>
> We would call that anarchy. Something like that occurred in Russia, and Russia immediately broke down.
>
> Yet, logically, the men at the front have just as much right to quit as the man at the rear. Both classes are in duty bound to defend the country, one by fighting and the other by working. One class keeps at the front only as long as the other class works to keep it there. A retreat would be no worse than a breakdown of supplies. One would mean the other.
>
> The President is asking labor to enlist voluntarily for the period of the war. The great majority of workers are already voluntarily enlisted and faithfully serving in the ranks of toil.
>
> But what about the slackers? We can't get them into the ranks of labor by appeals to their patriotism any more than we can get them to volunteer for service in the army.
>
> Yet they must do their bit, if justice is to be done to the men who are faithful. We don't want a system that will punish faithful workers by increasing their hours and at the same time permit slackers to escape work altogether.
>
> In short, as I see it, everybody, sooner or later, must be conscripted for the work he is best fitted to do. If this be done soon, the war will be won soon; if late, the war will be prolonged.
>
> Let us take a hint from the enemy, who always tries to do that which is necessary for success, whether it is pleasant or not. The enemy has industrial conscription in force.
>
> Hence, every man and woman in Germany is really a part of the great army that is dealing such tremendous blows to Russia and Italy.
>
> The German nation is fighting, and not merely the German army. It is up to the whole American nation to form a fighting unit, not leaving the burden to the army alone. From the men in the trenches to the men in the mines of Arizona or the timber camps of Oregon, there should be a perfect chain of active and alert soldiers of America, handling every link of the vast and complicated mechanism which America must develop to defeat Germany.

Conscription Proposed

The labor shortage in the leading industries so necessary to the vigorous prosecution of the war has induced certain officials of the Department of Justice to give some consideration to the possibility that it may be necessary to provide by law, by conscription or otherwise, for workmen to keep the mines, shipyards and munition factories going. The administration would be very reluctant to take such a step, and even discussion of the matter at this time is deprecated by the President's advisers. It is suggested in this connection that the situation may be somewhat relieved by a plan which the War Department is now working out which will provide for exemption from military service of a considerable number of men already registered and likely to be called in the next draft who are specially skilled in the industries upon which the war must depend. W. L. C.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has nearly completed the building of a new foundry at Cleveland, in which hand grenades for the Government will be made. The new foundry will be about 160 x 260 ft., and equipped with two 15-ton air furnaces. All the contracts for the buildings and equipment were placed some time ago.

The Stanley Club, of the Stanley Works, New Britain, Conn., has started the publication of a biweekly newspaper, the *Stanley Worker*, in order to keep in touch with employees of the company who have enlisted in the army. An interesting feature of the little paper is the correspondence corner, in which letters from soldiers are published.

OPEN WAREHOUSE AT DETROIT

Joseph T. Ryerson & Son Begin Operations at Fourth Unit of Warehousing Service

JOSEPH T. RYERSON & SON, Chicago, have now in operation their new warehouse at 470 Euclid Avenue, East, Detroit, the fourth unit in their chain of plants designed to give country-wide service to consumers of steel and steel products. The stock carried in Detroit will comprise the variety of materials and commodities carried at the other warehousing centers of the company, although it has been especially studied with a view of serving also the requirements of the automobile, auto truck and auto part industries. The list of material carried is a formidable one.

Close attention was given to the location of the new plant, and as a result the site on Euclid Avenue is central to the manufacturing districts of Detroit. City deliveries will be made by motor trucks, while out-of-town shipments are facilitated by connections with the Michigan Central and Grand Trunk Railroads.

The main building is 350 x 325 ft., with a three-story building 54 x 142 ft. The main building consists of a series of five bays, two being 50 ft. wide each and three being 75 ft. wide each, the approximate length of the bays being 350 ft., with cranes in each running east and west. The Michigan Central switch traverses the bays at the extreme west end and the Grand Trunk switch at the extreme east end. All buildings are of steel construction and concrete flooring is provided throughout the entire warehouse.

The offices of the plant are in a separate L-shaped building of steel and concrete construction, thus providing good light and ventilation. The main building is 40 x 75 ft., with a wing 30 x 45 ft.; part of the building being two stories. The general plan of the office is in line with the general plan of the corporation's other offices, being one large room with private offices partitioned off to a height of 8 ft. In this building are located locker rooms and lavatories for the office help and locker rooms and lavatories for the warehouse employees. The firm has installed a restaurant for the use of both office and warehouse employees. Careful supervision is given to the welfare of all employees, the purpose being to create the proper working conditions and environments. Rest rooms and reading rooms are provided, sanitary conditions are studied and attention is given to placing employees in the departments or lines of work for which their qualifications best equip them.

Plate shear and power driven roller table in new Detroit plant of Joseph T. Ryerson & Son. Capacity of shear is 1¼ in. thick and 72 in. wide.

The new plant contains complete and modern equipment for the warehousing and handling of all materials. Great attention has been given to the crane equipment and all details of handling. The team loading bay in Span A is equipped with two traveling cranes of 2-ton capacity each; Span B is equipped with one 5-ton and Spans C, D and E are equipped with one 10-ton crane each, arranged with two 5-ton hoists. The transverse travel is provided for by industrial tracks running through the plant, equipped with ball-bearing trucks and operated with storage battery motor-driven electric trucks. All tools in the plant are so located relative to the industrial track that material can be handled direct from unloading skids, either by hand or crane, to cars placed on the tracks. The plant is equipped with automatic dial scales, having three stationary platform scales of 5-ton capacity each, one portable 3-ton capacity and a 5-ton mill type scale.

The sheet shear located in Span B is of the gate type, with a capacity of shearing 3/16 in. thick by 120 in. wide at one stroke. The plate shear located in Span C is the gate type of shear and has a capacity of shearing 1¼ in. thick by 72 in. wide, with one stroke and shearing and cutting accurately to size. A feature of this equipment is the power-driven roller table, carrying the plate to the shear. The material is handled through the shear on an arrangement of gooseneck rollers. This arrangement permits of handling plates from the extremely wide to very narrow widths and access is provided for the operators, permitting them to work in and about the shear.

Friction saw in new Detroit steel warehouse. Has capacity for cutting structural sections up to and including 24-in., 100-lb. beams.

The friction saw located in Span D is the Ryerson friction saw, type 3, direct motor-driven. The blade of the saw is mounted direct on the armature shaft of the motor, which is capable of 100 per cent overload. The forward and back movements of the saw carriage are controlled by electric motor and arranged with oil checks which prevent overloading. The saw has a capacity for cutting all structural sections up to and including 24-in. 100-lb. beams. The periphery speed of the saw is 25,000 ft. per min. The angle shear located in Span E has a capacity of shearing angles up to and including 6 in. x 6 in. x 1¼ in., and bars of corresponding size.

The betterment department of the company studies all methods of operation. It seeks to improve on systems in use and devise new schemes to promote both efficiency of operation and the safety and welfare of employees. The firm has in use a carefully worked out bonus system in the operating departments of all plants. The betterment department plans the time allotments on which this system is based.

The Corrigan, McKinney New Steel Plant

Works Including Open-Hearth Furnaces, Mills for Producing Sheet Bars, Billets and Slabs—Blast Furnaces and Coke Oven Plant

THE completion of the steel plant of Corrigan, McKinney & Co. in Cleveland this past summer marked an important epoch in the steel-making industry of that city and northern Ohio. For several years, under the name of the River Furnace Co., the firm had been operating two blast furnaces in Cleveland, the first of which was blown in in 1910. Having ownership in large and important Lake Superior ore properties, it was decided to erect a steel plant to convert a portion of its ore into semi-finished steel and to make a corresponding increase in its blast furnace output. On March 13, 1913, it commenced the erection of the steel works and the first steel was poured Jan. 20, 1916, and the mills were placed in operation a few months later.

The steel plant is designed to roll blooms, billets, slabs and sheet bars, there being no finishing mills. On the completion of the open-hearth plant, the erection of four additional open-hearth furnaces was started. Provision for them had been made in the original plans and they were completed this year. A gas producer plant was built in connection with the open-hearth furnaces, but after the steel works were well under way it was decided to build a by-product coke oven plant, and this was placed in operation in the past year. Both of the new blast furnaces were completed last year, one being blown on May 13 and the second Dec. 30.

The open-hearth plant has twelve furnaces, of a rated capacity of 75 tons each, and it is equipped with a hot metal mixer of 1000 tons capacity. There are twenty-four soaking pits, each accommodating six ingots. The steel plant contains a 40-in. reversing blooming mill, driven by a twin-tandem compound engine, and a 21-in. four-stand and an 18-in. six-stand continuous sheet bar and billet mill, both driven by one motor. All products are rolled from the initial heat of the unit. The steel plant has an annual capacity of 500,000 tons of ingots and the same tonnage of rolled products. The coke oven plant includes 204 Koppers by-product ovens, with an annual capacity of 750,000 tons, and a by-product plant.

An important feature of the plant is a power house which supplies electrical power for practically the entire plant except the blooming mill. The entire plant was arranged and equipped throughout with a view of reducing to a minimum the amount of hand labor required in its operation.

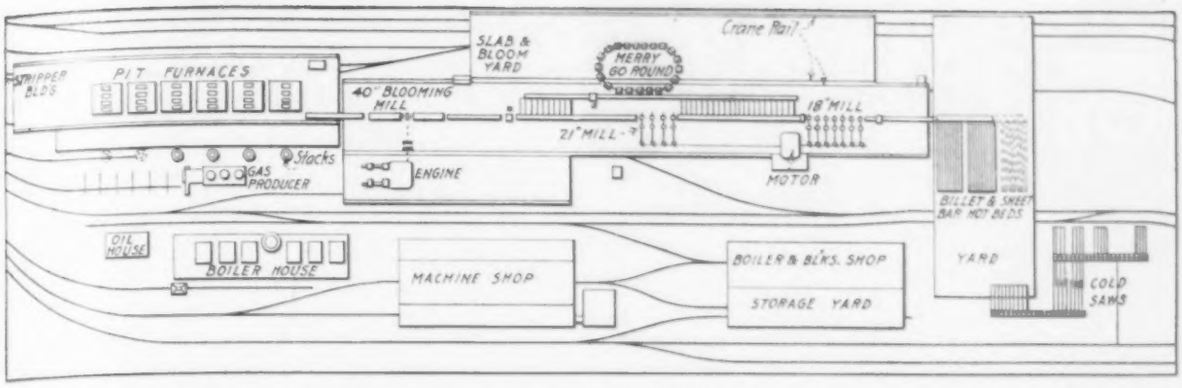
The blast furnace plant consists of the two old furnaces, each 83 ft. in height by 20 ft. 3 in., and the two new stacks, each 90 ft. in height by 22 ft. The old furnaces are of the vertical elevator type, steam driven and hand filled. The new furnaces have electric skips, and McKee distributors and steam driven bell operating mechanism. The daily capacity of the old furnaces is 350 tons each and that of the new stacks 500 tons each, making an annual output of approximately 625,000 tons, somewhat more than one-half of which is consumed in the steel plant.

The plant is located along the Cuyahoga River. The blast furnaces are on the west side of the river, the two new furnaces adjoining the old stacks, and the power plant is near the blast furnaces. The steel works and coke ovens are on the east side of the river and the pumping station between the river and the Ohio Canal, which parallels the river. Ore from the Lake Superior district mines is brought up the river to the dock adjoining the blast furnaces and is handled with three Hulett unloaders, each of 10 tons capacity, and two Brownhoist ore bridges having 10-ton buckets. The river is spanned by a private rolling lift bridge of the Scherzer type and having a single track and foot walk. Molten metal is conveyed over this bridge from the blast furnaces to the open hearth plant on a standard gage track. Practically all other tracks throughout the plant and yard used for hauling ingots, scrap, slag, etc., are of standard gage. The plant adjoins the Baltimore & Ohio and Wheeling & Lake Erie railroads, and is also served by the River Terminal Railway Co., a subsidiary to the Corrigan-McKinney interests.

The entire plant was designed and built under the direction of H. T. Harrison, general manager Corrigan, McKinney & Co., who was chief engineer of that firm when the plant was erected. Changing the name of the River Furnace Co., the plant is now operated as the River Furnaces, Corrigan, McKinney & Co., agents.

Hot metal is brought from the blast furnaces to the mixer building in 50-ton Pollock ladle cars drawn

The Top Roll of the 40-In. Reversing-Blooming Mill Is Balanced by Constant Pressure Furnished by an Independent Accumulator. The spindle from the engine to the pinion is a steel casting 21 in. in diameter and 7 ft. long



Blooms After Being Cropped Are Transferred Either to the 21-In. Mill for Rerolling or to the Drop and Runout Table Leading to the Merry-Go-Round Which Delivers Them to the Slab and Bloom Yard

by a yard locomotive. The mixer, instead of adjoining the open hearth plant, is located in a building about 200 ft. distant, and the delivery side of the mixer is on a line with the charging side of the open hearth building which is on the same level or 16 ft. 6 in. above the yard level. The hot metal mixer is of 1000 tons capacity and of the cylindrical type. This was supplied by the Pennsylvania Engineering Co.

The hot metal is weighed on a 150-ton Fairbanks scale on the ground floor in the mixer building. The ladle is lifted by a 75-ton Morgan crane and is poured through an opening in the roof of the mixer, being tilted by a 25-ton auxiliary. The crane has a span of 72 ft. 6 in. and the height of the crane runway from the yard level is 67 ft.

The mixer is electrically operated by two 75-hp. motors connected in series and either motor is of sufficient capacity to operate the mixer in case of an accident to the other. These motors can be disconnected from the mixer both electrically and mechanically. The receiving spout cover is operated by hoisting mechanism driven by a 5½-hp. motor manually controlled, arranged for dynamic breaking in the lowering direction.

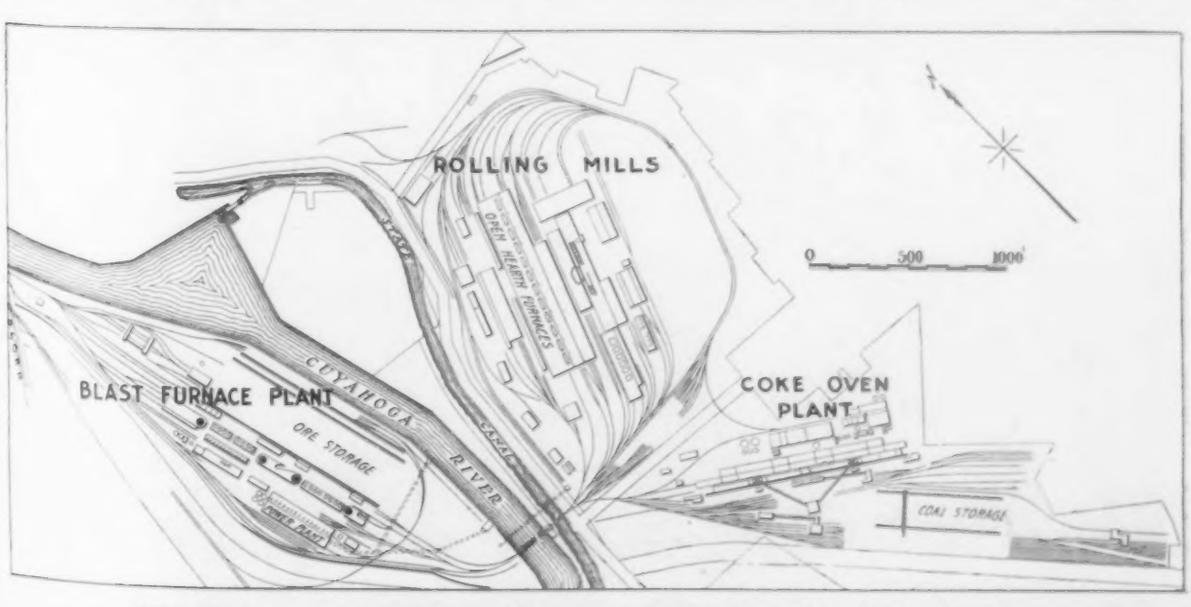
From the mixer the metal is poured into 50-ton ladles similar to those used in bringing the metal from the blast furnace to the mixer. The ladle stands on the weighing scale while being filled, the metal thus being weighed also when it leaves the mixer. A Baldwin-Westinghouse electric trolley locomotive hauls the hot metal ladle cars to the open hearth plant on a standard gage track.

The open hearth plant occupies a modern mill type of building 1000 ft. long and 141 ft. 6 in. wide. The charging side is 86 ft. wide from center to center of the columns and the pouring side is 65 ft. 6 in. wide. The furnaces are 68 ft. 6 in. in length and 18 ft. in width over all. The eight first built have hearths 36 ft. long and the others have hearths 42 ft. long. The width of the hearth in all of the furnaces is 15 ft. The checker work in the chambers is of a standard type made of 10½ x 4½ in. blocks. Knox type of water cooled doors and frames are provided and the charging doors are 36 in. high and 42 in. wide, and have 36 x 36 in. openings.

The regenerators located back of the furnaces are of a standard type with separate valves for gas and air. The gas valves are Dyblie valves and the air valves are of the standard mushroom type. The regenerator chambers are 25 ft. long. The air chamber is 13 ft. 10 in. wide and the gas chamber 8 ft. 5 in. wide.

Waste heat boilers are installed in connection with the furnaces. Steam at 180 lb. pressure is developed, some used in the gas producer plant for blowing, and the remainder is utilized for driving the blooming mill. The boilers are of the water tube type of 375 hp. rating, built by the Babcock & Wilcox Co. The waste heat is by-passed around each furnace stack through a flue 4 ft. 6 in. wide and 5 ft. 6 in. high. The flues pass under the furnaces to the gas producer house where the boilers are located. Each flue is provided with a hand operated damper for shutting off the direct flow of gases to the furnace stack. The furnace stacks are 5 ft. in diameter and 160 ft. high. The boilers are operated under mechanical draft provided by a turbine driven fan and an overhead connection delivers the spent gases into the furnace stack.

There are two 75-ton Morgan ladle cranes with 15-ton auxiliaries for charging the furnaces. The cranes have a span of 79 ft. 6 in., and ride on single Lorain T rails of 175 lb. section. A 7½-ton monorail Pawling & Harnischfeger trolley is provided in the open hearth department for expediting repair work, as on the traveling cranes. For charging scrap, ore and other material there are two 4-ton low type Morgan charging ma-



Molten Pig Iron Is Conveyed to the Steel Plant Over a Lift Bridge Spanning the Cuyahoga River

The 18-In. Mill from the Delivery Side Showing Runout, Flying Shear and Shear Delivery Table Having a Hinged Section for Delivering the Product Either in Sheet Bars to the Sheet Bar Piling Rolls or in Billets to the Hot Bed

chines. Charging boxes of pressed steel with cast steel ends, 6 ft. 9 in. long, 2 ft. 3 in. wide and 8 in. deep inside measure, are used.

Ore and limestone, dumped from a trestle track into six 2-carload-capacity steel bins, are discharged from these bins through gated bottoms into the charging boxes. These, already on cars, are hauled to the charging floor by a yard locomotive. The scrap yard is served by two 10-ton, 75-ft.-span Morgan cranes equipped with E. C. & M. magnets.

The pouring side of the open hearth plant is served by three 150-ton Morgan ladle cranes with a 59-ft. span and having 25-ton auxiliaries. There are three pouring platforms each 205 ft. in length and accommodating two heats. The metal from the smaller furnaces is poured into 90-ton ladles and that from the larger into 105-ton ladles of the Treadwell manufacture. The ingots are cast in 20 x 22 in., 22 x 22 in., and 22 x 28 in. sizes and are poured on three mold buggies. The ingot mold yard at the side of the pouring bay is served by a 10-ton crane.

Pollock pots of about 200 cu. ft. capacity take the slag. At the dump, scrap steel is recovered by means of a magnet loading crane. The skull breaker crane has a 110-ft. per minute hoist. It has a 75-ft. span and its runway is 60 ft. above the yard level. A lower crane has a grab bucket for handling the scrap and slag.

Three of the open hearth furnaces are fired with producer gas and nine with coke oven gas and tar. Four batteries of producers were installed for the eight original furnaces, with five producers in each battery. Coal is unloaded in the producer building from the yard level into hoppers under the track, and a conveyor carries it to the crusher which distributes it into buckets which operate automatically. As the bucket is loaded it settles down on a lever which trips a switch to the motor and this automatically closes the gate on the discharge end of the crusher. The motor raises the bucket and dumps it into a 600-ton hopper above the producer building, one empty bucket being carried down while the filled bucket is being elevated. From the main overhead hopper a larry car distributes the coal to hoppers over each producer.

Adjoining the stock yard is a calcining plant. This includes dolomite bins and a crane which serves two 10-ton cupolas for calcining the dolomite, an 8-ft. dry and an 8-ft. wet grinding pan, and a jaw crusher. The dolomite, after being calcined, goes to the dry crusher which has a grate bottom and is then carried by a bucket conveyor to a bin overhead. From this bin it is carried by a larry bucket to the open hearth plant.

The soaking pits are located in a steel frame building, 350 ft. long and 73 ft. 6 in. wide. Ingots are here stripped on a 150-ton Morgan screw stripper. The 24 soaking pits are arranged in six rows, and each pit accommodates six 20 x 22 in. ingots. Though ordinarily using coke oven gas, they may be changed over to producer gas in a few minutes. The covers are hydraulically operated. A Dyblie type of reversing valve is used on the regenerating system, one for each of the six rows of furnaces. These valves are water cooled and hydraulically operated. Two 10-ton vertical ram soaking pit cranes, with a 5-ton auxiliary for handling covers, serve also for general repair work and a 7½-ton monorail trolley runs over the stripper and soaking pit cranes.

The mill building which houses the blooming mill

The 21-In. Mill from the Platform Back of the Electric Shear Showing Also the Skew and Transfer, and at the Left the Approach Table to the Electric Shear. At the extreme left is the merry-go-round, and just outside the building on this side the bloom and slab yard

and two continuous mills is 697 ft. long and 80 ft. wide, and is served by a 50-ton crane with a 10-ton auxiliary having approximately a 30-ft. lift, and a 25-ton crane with a 5-ton auxiliary, both cranes serving the three mills.

In usual practice a 20 x 22-in. ingot is reduced in the blooming mill to 4 x 4-in. billets up to 14 x 14-in. blooms, or slabs 12 x 2 in. up to 26 x 8 in. The standard 20 x 22-in. ingot is reduced to a 4 x 4-in. billet in twenty-three passes. Large slabs are rolled from 22 x 28-in. ingots and large round bars for shells from 23 x 23-in. ingots.

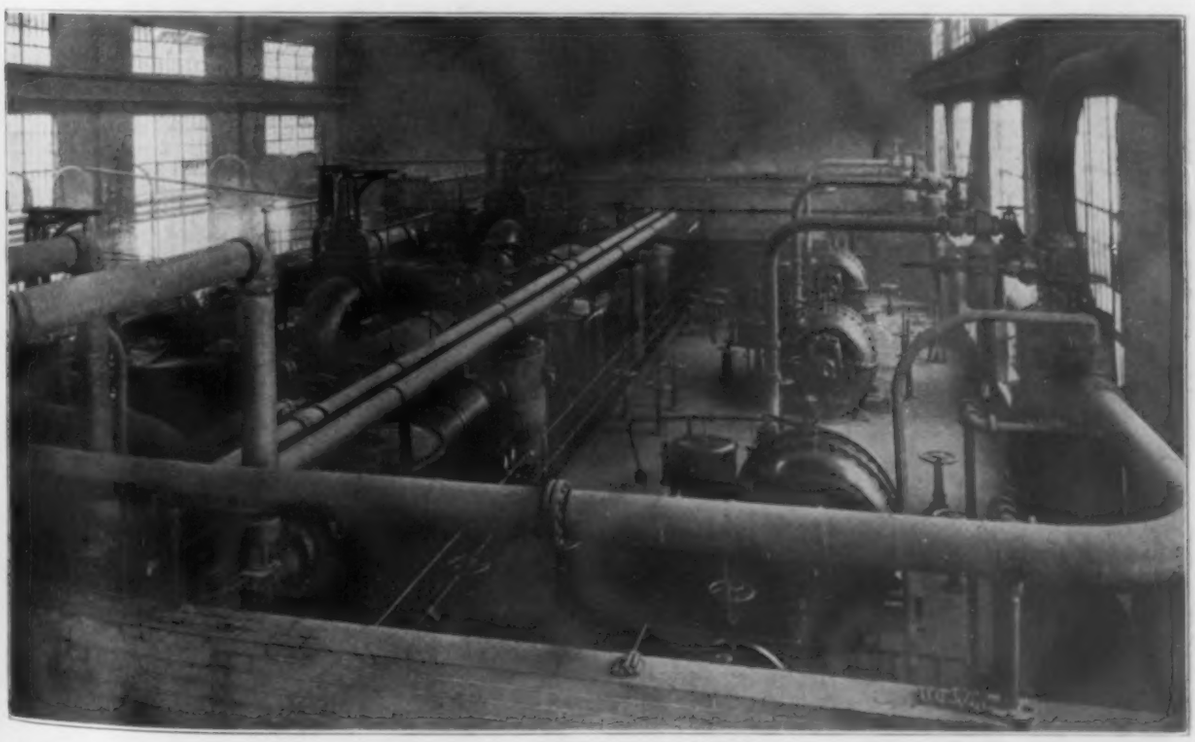
After cropping, the pieces are delivered by the shear run-out table to a skew and a rail type of transfer table which delivers them to an approach table to an electric shear. On this they are sheared into commercial billets, slabs and blooms of various lengths. From the shear they are conveyed on drop and run-out tables 50 ft. long driven by a 45 hp. motor. An electrically controlled kickoff pushes them off upon cars which are hooked together in a continuous train on an oval track designated as the "merry-go-round." On this track they are hauled outside the building to the bloom and slab yard. There are 21 of these cars 10 ft. long, and they are electrically propelled by a 100-hp. motor, being moved ahead one car length as a car is loaded. The cars are propelled by a dog and their movement is automatically controlled. All that is required of an operator is to start the motor, which moves the cars the required distance and spots them, the dog then returning to its original position where it stops. The bloom and slab yard is served by a 25-ton and a 15-ton crane for loading standard railroad cars.

The blooming mill is a standard 40-in. reversing mill built by the United Engineering & Foundry Co. The width of the top roll is 30-in. and the length of the roll between housings is 86 in. The top roll is balanced by constant pressure furnished by an independent accumulator. The screw-down gears are operated by a 100-hp. motor. The mill housings and pinion housing are steel castings, the former weighing 55 tons each. The leading spindle from the engine to the pinions is a steel casting 21 in. in diameter and 7 ft. long. The spur pinions have smooth machine cut teeth that run in oil. All mill table gears are steel castings with machine cut teeth and run in oil.

The blooming mill approach table is 70 ft. long and has 33 rollers 16 in. in diameter and is driven by a 50 hp. motor. The ingot buggy that delivers the ingot to the table is driven by a 43-hp. mine type motor. The front and rear mill tables are each 40 ft. long and contain nineteen rollers on each side. These are 18 in. in diameter except the two feed rollers which are ¾ in. and ¼ in. larger. The feed rollers and the two rollers adjoining these on each side are solid forgings. The remainder of the rollers are cast steel. The front and rear mill tables are each driven by two 100-hp. motors connected permanently in series. The manipulator is of the Kennedy type.

The shear approach table is 70 ft. long, contains 26 rollers 16 in. in diameter and is driven by a 50 hp.

One of the 375-Hp. Waste-Heat Boilers Before It Was Bricked Up. These boilers are located between the gas producers and operate on forced draft. Waste gases are by-passed around the furnace stacks through flues provided with hand operated dampers



The By-Product Plant Showing at the Right the Turbo Exhausters That Are Used Instead of Blowers for Drawing the Gas from the Ovens and Forcing It Through the Apparatus. The tar extractors, reheaters and saturators are shown at the left

motor. The ingot chariot, blooming mill tables and the hydraulic and electric shears were built by the United Engineering & Foundry Co.

The run-out table from the hydraulic shear is 80 ft. long, driven by a 40-hp. motor. The transfer table is 30 ft. wide and 60 ft. long, with power supplied from a 40-hp. motor. The drop and run-out table back of the electric shear is 50 ft. long, each part of the table being driven by a 40-hp. motor. The kickoff is also operated by a 40-hp. motor. The electrically operated shear is 8 x 36 in. in capacity and is driven by a 150-hp. wound rotor induction motor. This shear is equipped with an electric trip and an electrically operated gage and stop, the gage and stop being operated by a 5½-hp. motor.

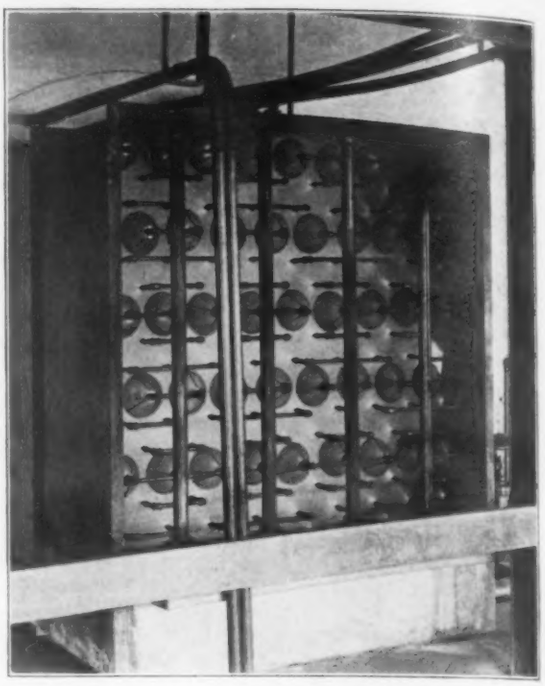
The hot saw is so located that the table which feeds the electric shear also feeds this saw. This is accomplished by driving the table in the opposite direction. The hot saw, which is used for sawing alloy steel, is 54 in. in diameter and is belted to a 250-hp. cage wound induction motor. Feed is obtained by hydraulic pressure. The saw table is driven by a 60-hp. motor.

The blooming mill is driven by a 46 x 76 x 60-in. Mesta twin-tandem compound single lever control reversing engine, with a rated capacity of 35,000 hp. It has a barometric condenser with an independent steam-driven air pump. The engine is a duplicate of one installed in the plant of the Youngstown Sheet & Tube Co. It is operated on a steam pressure of 200 lb., the greater part of the steam being supplied by the waste heat boilers connected with the open-hearth furnaces.

The blooming mill boiler plant consists of six 825-hp. Stirling boilers, three of which are fired with coke oven gas, two with coal and one with coke breeze, the last three being spare boilers. The coke breeze boiler is equipped with a special Coxe stoker and the remainder with Green chain grate stokers, the gas fired boilers being arranged for substituting coal for fuel. The blooming mill engine room and the electric sub-station which occupies the same building are served by a 60-ton crane with a 10-ton auxiliary.

Continuous Sheet Bar and Billet Mills

Blooms that are to be rerolled in the 18-in. and 21-in. continuous sheet bar and billet mill, instead of being transferred to the electric shear referred to, after leaving the hydraulic shear run-out table go to the approach table to the 21-in. mill. This table is 60 ft. in length and is driven by a 50-hp. motor. The 21-in. mill consists of four stands of rolls and this mill as well as the 18-in. mill are standard Morgan 2-high mills.

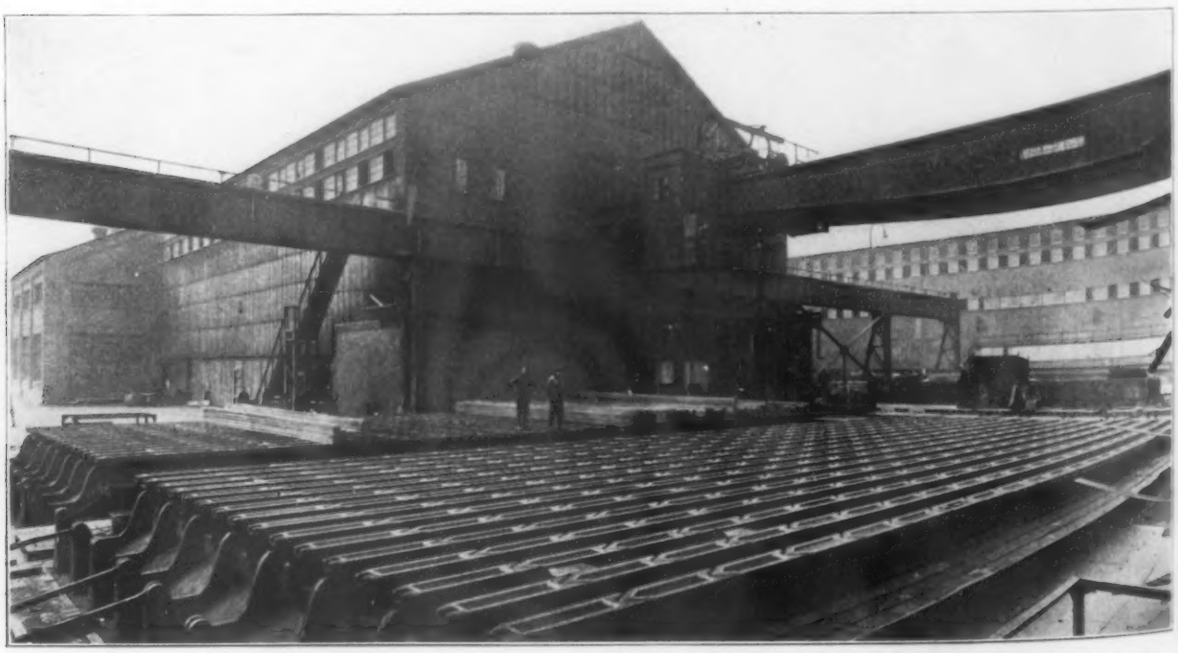


The Main Generators in the Power House Are Equipped with Air Washers. Two of these are 25,000 cu. ft. per min. units and the other has capacity for 15,000 cu. ft. of air per minute

The 21-in. mill relieves the blooming mill of rolling small sections when crowded to capacity and thus permits an increase in output. For example, it would require 23 passes to roll a 4 x 4-in. billet in the blooming mill, but the number of passes is reduced to 15 and the steel is delivered in the form of 6 x 7-in. blooms to the 21 in. mill, which then produces the 4 x 4-in billet.

The 21-in. mill delivers to a skew connecting table 145 ft. long, driven by a 50-hp. motor. From this table, if no further reduction is necessary, the product is transferred across a standard rail type of cooling bed 135 ft. long and 30 ft. wide, driven by a 37½-hp. motor, to a shear table 140 ft. long driven by a 45-hp. motor, this table returning the product to the electrically driven shear and finally to the bloom and slab yard.

The 18-in. continuous mill is an 8 stand mill consisting of six stands of the standard type of Morgan



Billets Are Delivered to a Double Hot Bed in the Sheet Bar and Billet Yard, Which Is Served by a 15-Ton Crane with a 120-Ft. Span

mills, and two 16-in. vertical edging rolls. One of these rolls precedes the 18-in. stand and the other is between the second and third stand of the 18-in. mill. Directly in front of the 18-in. mill is a mechanically operated preliminary trip shear which is provided for emergency purposes to prevent trouble in case of bad ends which can be conveniently clipped off before the piece enters the rolls. The 18-in. mill is used for rolling sheet bars and billets. Sheet bars are rolled to any foot weight and in widths of 8, 10 and 12 in. The mill is provided with duplicate sets of housings, one set for billets and the other set for sheet bars. The housings are lifted in and out of the mill by means of the overhead crane. The 16-in. vertical edging rolls are used to control the width on sheet bars, the pieces not being passed through these rolls in making billets. Billets produced on the 18-in. mill range in sizes from 1½ x 1½ to 3 x 3 in. inclusive. Sheet bars are rolled down to ¼ in. in thickness. When producing the thin sizes the pieces are passed through the six stands of rolls, but fewer stands are used in making thicker sizes.

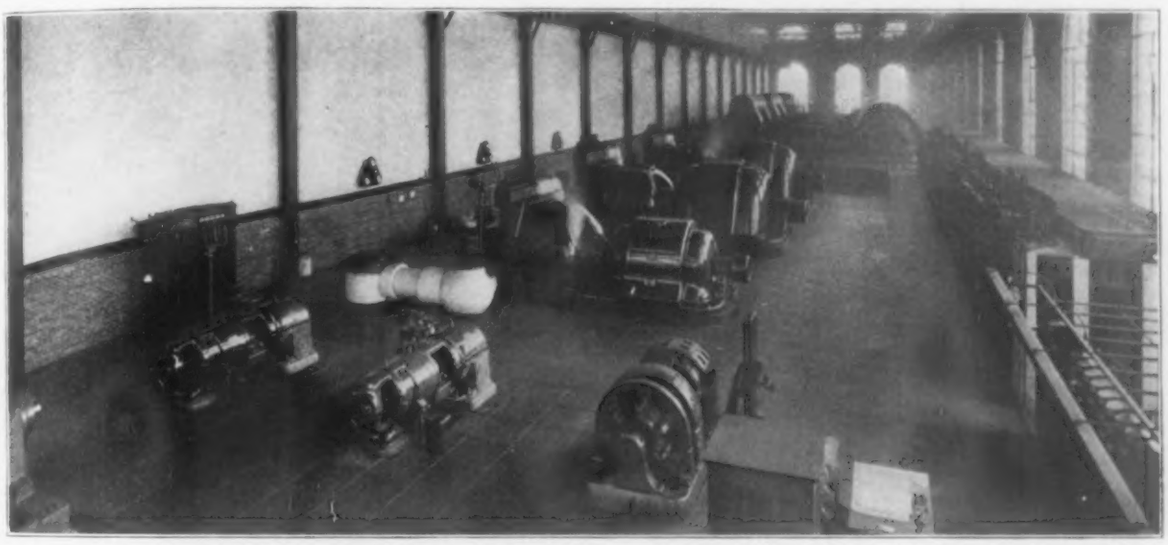
Sheet bars and billets rolled on the 18-in. mill are sheared, usually in 30 ft. lengths, on a Morgan flying shear having an approach and delivery table 30 ft. long. This table is driven through a shaft and gears from the mill drive. Change gears are provided for regulating the speed of the delivery table to correspond with the speed of the mill stand from which the sections are being delivered. The delivery table from the flying shear is hinged so that when rolling sheet bars the back end of this table is raised to a higher elevation to deliver the product into Morgan sheet-bar piling rolls, operated by a 30 hp. motor, which deliver it into a piling rack under the crane in the sheet bar and billet yard.

When billets are being rolled, the piling rolls are lifted up and moved out of the way by means of the crane, and the hinged section of the flying shear delivery table is dropped to the elevation of a skew piling table and the billets pass to a standard Morgan double hot bed, 90 ft. long and 60 ft. wide, in the sheet bar and billet yard. The skew piling table is 65 ft. long and is driven by a 75-hp. motor with special windings. The hot bed has a disappearing stop between its two sections, driven by a 5½ hp. motor, straight edges and transfer jacks. The straight edges and two dogs that carry the product off the hot bed are each driven by two 50 hp. motors. The steel drops from the hot bed into a receiving rack on a scale.

The sheet bar and billet yard equipment includes two 54-in. Ryerson cold saws each driven by a 45-hp. three-phase induction motor, the saws being located on an armature shaft extension. The saw feed is driven by an induction motor. The saws are located near the end of the yard and are served by the yard crane. This yard is also provided with a Mesta scrap shear of the alligator type having a capacity for cutting 6 x 6-in. cold steel and driven by a 75-hp. induction motor. The sheet bar and billet yard are served by a 15-ton single-trolley double-hoist Morgan crane of 120 ft. span.

The 21 in. mill rolls are 23 to 22½ in. in diameter by 48 in. between bearings and have necks 14 in. in diameter by 17½ in. long. The housings are steel castings. The 18 in. mill rolls for billets are 18.45 in. in diameter and for sheet bars 18.50 to 17.92 in. in diameter. The billet rolls are 27 in. long and the sheet bar rolls 20 in. long. The necks are 12 in. in diameter by 15 in. long.

The two continuous mills are driven by a 5750-hp., wound rotor General Electric motor taking 6600 volt three-phase twenty-five cycle current and having a full load speed of 92½ r.p.m. The motor is connected to the line shafts of the mills by two breakable spindles, one on each side of the motor. The master controller is located remote from the motor on a pulpit convenient for vision of the mills. The line shafts extend parallel to the mill stands, the 21 in. mill shaft running south from the motor a distance of approximately 120 ft. to the last-stand bevel gear reduction, and continuing on for the reduction of the other three stands. On the 18 in. mill end the shaft runs north approximately 20 ft. to the first stand reduction for that mill and continues on for the other five stand reductions. The main driving shafts are steel forgings, being 15 in. in diameter for the 21 in. mill and 15¼ in. for the 18 in. mill.



The Main Power Plant Showing the Low-Pressure Turbine Equipped with a Multi-Port Flow Valve as the First of the Three Turbine Units. In the foreground are the exciters and in the rear are blowing engines

The Main Power Plant

The main power plant, which is located near the blast furnaces, supplies power for practically the entire plant except the blooming mill. It serves the blast furnaces, open hearth plant, continuous mills, pumping station and coke oven plant. It also furnishes the air supply and the filtered water for the entire plant for steam purposes, including that for the waste heat boilers, and service water for the Nos. 3 and 4 blast furnaces, the water for the two new blast furnaces being supplied from the old blast furnace power plant. It occupies a structural steel frame building 76 ft. wide, 408 ft long and 127 ft. high. The walls are of paving brick and the roof is of reinforced concrete.

The water supply reaches the plant from the river through a reinforced concrete tunnel 123 ft. long and 6 ft. square. The discharge is through another tunnel of the same dimensions as the intake tunnel. Water is pumped into a stand pipe 125 ft. high and 21 ft. in diameter. The discharge from the pumps to the stand pipe is through a pipe running up through the inside to the top of the stand pipe, thus maintaining a constant head on the pumps. The general service pumps comprise two De Laval turbine driven centrifugal pumps,

each having a capacity of 5000 gal. per minute against a 142 ft. head, and two motor driven centrifugal pumps of the same capacity. Two revolving screens at the intake approximately 6 ft. wide on 27-ft. centers, with ⅜ in. mesh screens intercept suspended matter in the water. These screens were supplied by the Chain Belt Co. and were described in THE IRON AGE, May 11, 1916.

The filtration plant consists of a We-Fu-Go intermittent system with a capacity of 74 gal. per hour. There are four wooden settling tanks 19 ft. 6 in. high and 30 ft. inside diameter, on reinforced concrete foundations; two rectangular filtering beds approximately 22 ft. long and 7 ft. wide and one concrete clear well of the same dimensions.

The boiler plant consists of fifteen 823-hp. Stirling water-tube boilers. The boilers are placed 22 ft. above the yard level, so that cars may run under the stokers. Babcock & Wilcox superheaters rated for 125 and 150 deg. Fahr. above saturation at 250 lb. pressure are provided. The boilers are also equipped with Diamond soot blowers, seven revolving units for each boiler. General Electric indicating steam flow meters are also installed.

Ten of the boilers are equipped for burning waste gas from the blast furnaces and five have Green automatic chain grate stokers. The stoker fired boilers are equipped with Richardson automatic scales under the coal chutes in front of the boilers. Each is also equipped with an Ellison draft gage. The steel breeching, 360 ft. long and 10 ft. square, connects to two brick lined and grouted steel stacks, 275 ft. high and 15 ft. in diameter. A main steam line 8 in. in diameter leads down from each boiler to a main steam header which increases from 8 to 14 in. in diameter.

Coal for the power house is dumped from cars into a 50-ton hopper located outside of the station. An elevator carries the fuel into a crusher of 50 tons per hour capacity. Then it is elevated and distributed into coal hoppers, two hoppers to each boiler, an endless canvas belt being employed. The coal handling plant was installed by the Stephens-Adamson Co. The ashes are dumped from hoppers directly into railroad cars on a track which runs under the stokers.

The boiler plant has two 10,000-hp. Cochrane metering feed water heaters and two feed pumps of 1000 gal. per minute of the DeLaval turbine driven centrifugal type and two Epping Carpenter duplex pumps, each having a capacity of 500 gal. per minute.

The blowing engines for the blast furnaces consist of three horizontal cross compound non-condensing Mesta engines each of about 3000 hp. capacity rated to deliver 60,000 cu. ft. of air per minute at 100 r.p.m. These engines are normally run at 75 r.p.m. with a delivery of 45,000 cu. ft. of air per minute. Two engines supply the air for two blast furnaces, the third engine being a spare installation. The other two blast furnaces are blown from engines located in the old power house. The blowing engines and steam driven auxiliaries exhaust into one 24 in. common exhaust header. This is protected against exterior pressure by a Cochrane multi-port back pressure valve. Richardson-Phenix oil filters are used for the lubricating oil.

The electric power units comprise three 2500 kw. mixed pressure Curtis steam turbines driving 2500-kw. alternating current 25-cycle 6600-volt generators. Each unit is provided with a Westinghouse surface condenser. The circulating pumps are turbine driven, and the pump capacity is 16,000 gal. per minute. The condensers also have turbine driven condensate and air pumps There is one 1000 kw. Westinghouse synchronous motor 250 volt direct current motor generator set and a 1500 kw. motor generator set, the latter largely for cranes.

Each main generator is equipped with an air washer made by the Spray Engineering Co., Boston. The washers are, of course, to keep dust out of the ventilating air and incidentally give a cool supply. One of the washers has a capacity of 15,000 cu. ft. and the other two each have a capacity of 25,000 cu. ft. per minute. They are located on a mezzanine floor in the power plant.

An underground conduit system is used for carrying the power cables across the river, a tunnel approximately 60 ft. below the yard level and 500 ft. in length and 7 ft. in diameter, of brick construction was built. Power is transmitted to the steel plant by a trunk system of cables to a sub-station located at the steel plant, distribution for the individual departments being made from this main sub-station to three other sub-stations. The filtered water supply is carried under the river from the main power house through a line in the tunnel that carries the transmission lines.

The Coke Oven Plant

The coke oven plant consists of 204 Koppers 12½-ton ovens arranged in a straight line in four batteries of 51 ovens each. The surplus gas supplies the open hearth plant, soaking pits and blooming mill boiler house. Electricity for operating the coke plant comes from the main power house and steam from the blooming mill boiler house. Steam is carried in an 8-in. and 12-in. overhead supply line for supplying three turbo exhausters, a steam driven booster, an engine that drives the pumps, and a branch line carries steam to the benzol plant. In the by-product plant tar and sulphate of ammonia are recovered and in the benzol plant toluol, xyol, solvent naphtha and naphthalene.

On an 18 hour coking time the plant will carbonize 3500 tons of coal and produce 2400 tons of coke. The coal storage space is 200 ft. wide and 700 ft. long and is served by a Brownhoist coal handling bridge. The coal handling plant has a capacity for handling 500 tons of coal per hour. It includes three duplex track hoppers equipped with duplex shaking feeders, two Bradford breakers, four Pennsylvania hammer mills, four mixing bins and two coal larry bins of 1800 tons capacity each.

Atlas make of quenching cars, propelled by a General Electric locomotive are used. The coke is quenched with water supplied from the primary coolers of the recovery plant. This water is pumped to a 20,000 gal. tank over each of the two quenching stations.

The by-product plant occupies a building 75 x 396 ft. in size and consists of three complete units, two of which are of sufficient capacity to take care of all the gas from the ovens. General Electric turbo-exhausters are employed for drawing the gas from the ovens and forcing it through the apparatus. The surplus gas is moved at 5 lb. pressure at the booster outlet. Tar from the by-product plant is delivered to the open hearth furnaces in a 4 in. line, to which is connected an Auldrich triplex single acting plunger pump.

Metal Trades to Hold a Win-the-War Meeting

A "Win-the-War" meeting is to be held by the Boston branch of the National Metal Trades Association at the City Club, Boston, Friday, Nov. 16. The program provides for an afternoon conference at 3 p.m. and a dinner at 6 p.m. with the following program:

For the afternoon: Walter Drew, counsel, National Erectors Association, "The Experience of British Industries in the War and Its Lesson to Us." Clarence E. Whitney, Whitney Mfg. Co., Hartford, Conn., "The Hartford Plan for Co-operative Employment Control." David S. Earll, employment manager, New Process Gear Corporation, Syracuse, N. Y., "Our Experience with the Employment of Women."

For the dinner: Walter Gordon Merritt, counsel, American Anti-Boycott Association; Col. Tracy C. Dickson, commanding officer, Watertown Arsenal, Watertown, Mass., and James J. Storrow, fuel administrator for New England. A representative of the National Council of Defense is also expected to speak.

The Durbin Automatic Train Pipe Conductor Co. has acquired a site in East St. Louis, Ill., where it will equip a plant at a cost of about $150,000, the first of a series of units to be built in different parts of the United States for the manufacture of flexible pipe joints and an automatic train pipe conductor. The site occupies three and one-half acres and will ultimately be covered by the plant of the company, which has offices in the Pontiac Building in St. Louis. It will include malleable castings in its general output.

Motor-Driven Vertical Pickling Machine

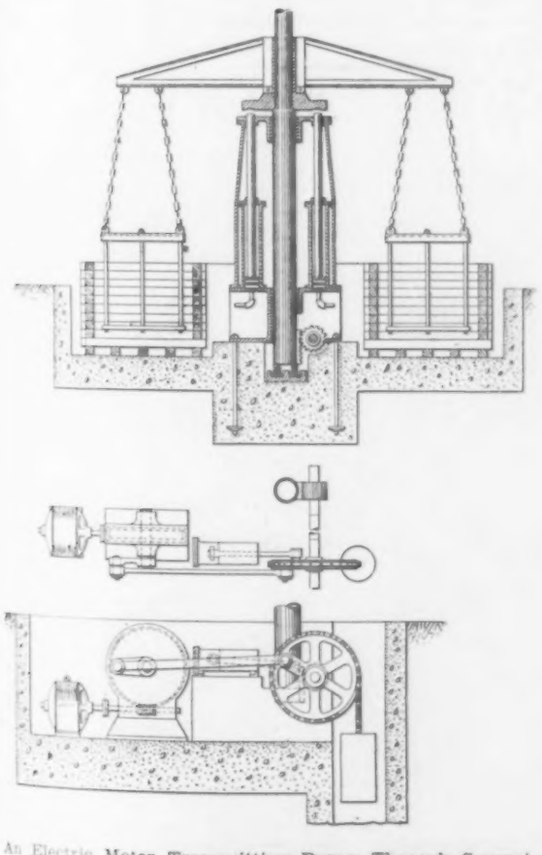
As a substitute for the steam-driven machines used for pickling white and black sheets in tin and in some sheet mills, A. E. Maskrey of the Carnahan Tin Plate & Sheet Co., Canton, Ohio, has patented a motor-driven balanced vertical machine. The pickling movement is the same as in the steam-driven machines generally employed, with the added advantage that it is possible to run the motor-driven machine faster, if that should be found desirable. In addition to the motor operation for the pickling movement a compressed air arrangement is employed for use when changing from one tank to the other.

The machine consists of a vertical ram with four arms, from which are suspended the crates carrying the material to be pickled. An A-frame is fastened to the sub-base and together with it supports and guides the ram of the machine. The operating mechanism consists of a controller for the motor and a two-way valve for regulating the supply of air used in changing from tank to tank. These are situated at a convenient location near the machine, and the motor and the moving parts are placed at a sufficient distance from the ram to eliminate danger of trouble from water, while at the same time enabling them to be inspected and repaired easily.

The motor is connected to a worm reduction gearbox which enables the speed of the pickling machine to be varied within the ordinary limits. A crank is attached to the wormwheel shaft and transmits power through a connecting rod to the oscillating balance wheel, the power being transmitted from there by a shaft to a pinion meshing with a rack on the bottom of the ram.

When changing from one tank to another, compressed air is admitted to two vertical cylinders inclosed in the A-frame. This raises the arms and the suspended crates, etc., above the level of the tanks, annular ball bearings on bottom of the sleeve which slides on the upper part of the ram, making the turning a comparatively easy matter. When the work is being shifted from one tank to another, the ram remains stationary. If no other source of air is available, a single-air compressor is attached to the oscillating balance wheel by a connecting rod and operates on the downward stroke of the ram.

A weight suspended from the balance wheel takes care of the weight of the ram, the arms, the crates and the material to be pickled, which, it is pointed out, eliminates the operating cost of the unbalanced steam-driven machine. The thrust of the pinion on the bottom of the ram is taken by a long split bearing and the guide bearing on the top of the A-frame is of the same type. Both of these bearings can be readily renewed when they become worn.



An Electric Motor Transmitting Power Through Several Sets of Gears and a Crank Arrangement Raises and Lowers Material in the Pickling Tanks while Compressed Air Is Employed for Lifting when the Work Is Being Changed from One Tank to Another

Midvale Steel Companies Merged with Dinkey as President

Alva C. Dinkey, who has been president of the Midvale Steel Co., has been elected president of the Midvale Steel & Ordnance Co., succeeding William E. Corey, who has been made chairman of the executive board. It is announced that the Midvale Steel Co., Worth Brothers Co., at Coatesville, and the Wilmington Steel Co., Wilmington, subsidiaries of the Midvale Steel & Ordnance Co., have been merged and that hereafter the Midvale Steel & Ordnance Co. will be the operating concern. The other companies will lose their identity. The Midvale Steel Co. will be known as the Nicetown works, the Worth Brothers Co. as the Coatesville works and the Wilmington Steel Co. as the Wilmington works. The Cambria Steel Co., Johnstown, Pa., the largest unit in the Midvale group, will maintain its name and organization because a part of the stock is still in the hands of the public and also because an old lease of the property from the Cambria Iron Co. provides that the name Cambria is to be retained for 999 years. The new officers of the Midvale Steel & Ordnance Co. are as follows: W. E. Corey, chairman of the board; A. C. Dinkey, president; William B. Dickson, vice-president; Edwin E. Slick, vice-president in charge of operations; John C. Neale, vice-president in charge of sales; H. S. Black, assistant to president; D. B. Gehl, treasurer; Robert Brewster, secretary; Marshall Lapham, controller; James M. Milliken, auditor; Joseph Hill and L. K. Krause, assistant treasurers; T. B. Bustis and W. A. Martin, assistant secretaries; S. C. Yeates, purchasing and H. C. Crawford, traffic manager. Ambrose Monell, having accepted a position in the United States Army, resigned as a director of the company.

Brass Companies Consolidate

The Connecticut Brass Corporation, West Chesire, Conn., and the Pilling Brass Co., Waterbury, Conn., have been merged into one company, to be known as the Connecticut Brass & Mfg. Corporation, with capital stock of $600,000 8 per cent first preferred stock, $400,000 8 per cent second preferred and $2,000,000 common stock of $10 par value. The two companies have a combined smelting capacity of 2,500,000 lb. of finished brass annually.

The Dominion Iron & Steel Co., Sydney, N. S., posted notices at its plant on Nov. 1, reading as follows: "Effective Nov. 1, 1917, a general increase averaging 10 per cent will be granted to employees of the steel plant. The rate for common labor will be 24 cents per hour." This is the fifth increase granted by the company since the beginning of 1916, given at approximately six-month intervals, and it brings the total increases since January, 1916, up to 53 per cent. Since January, 1916, the increase in the rate of the ordinary labor has totaled 71 per cent.

The Syracuse Smelting Works, Brooklyn, N. Y., wishes it known that one Anthony George, recently convicted and sentenced to a term of three years in the Federal prison at Atlanta, is not the Anthony George of the Syracuse company who enlisted in the cavalry immediately upon the entrance of the United States into the war and is now in camp at Fort Riley, Kan.

Large Increase in Machinery Exports

All Records Broken in September Despite Embargo Policy of the Government—Value of Iron and Steel Products Much Higher

WASHINGTON, Nov. 12.—The exports of manufactures of iron and steel in September made an astonishing record in view of recent tendencies attributable to the embargo maintained by the War Trade Board. While the shipments of tonnage commodities were below the average of the past six months, the exports of machinery broke all records and the exports of iron and steel by values reached a total which has been exceeded but three times in the history of the industry. While higher prices are to some extent responsible for the surprising record made in September, the detailed figures showing quantities of highly manufactured articles make it clear that actual increases in exportations have helped materially to swell the total.

Total exports of iron and steel in September gained 20 per cent over August, the figures having been exceeded only in January, March and June of the present year, the last-named month holding the record. Shipments of tonnage iron and steel declined 24 per cent from the level of September, 1916, and while they exceeded the figures for July of this year by a large margin, they showed a loss compared with August when a notable upward tendency developed. Exports of machinery surpassed the high water mark reached last June by a fraction of 1 per cent and gained 37 per cent over September of 1916. Shipments of machine tools, which have been declining irregularly during the past year, closely approximated the substantial total of September, 1916.

The record for the nine months ended Sept. 30 shows gains all along the line, except in machine tools. Total imports of iron and steel by values increased 50 per cent over the same period of 1916, which was 140 per cent above the level of 1915. In tonnage commodities the nine months showed a gain of 4 per cent over 1916, machinery rose 21 per cent and machine tools declined 3.3 per cent.

The value of all shipments of iron and steel products in September was $107,665,824 as compared with $90,895,592 for the same month of 1916 and $119,141,836 for June of this year, which is still the record total. For the nine months of 1917 the total was $911,438,464 as compared with $619,853,667 for the corresponding period of 1916, and $251,220,008 in 1915. Exports of machinery in September were valued at $27,947,134 as against $20,508,455 for the same month a year ago. The largest previous monthly exports of machinery were made in June of this year, when the total was $27,946,036. For the nine months, the total was $203,727,900 as compared with $168,570,287 for the same period of 1916. Shipments of metal-working machinery aggregated $7,891,349 as against $7,901,328 in the same month of 1916. For the seven months of 1917 the exports totaled $61,055,803 as against $63,218,202 for the corresponding period of 1916. Details of the exports of machinery in September, 1916 and

Imports of Iron and Steel

	September		Nine Months	
	1916 Gross Tons	1917 Gross Tons	1916 Gross Tons	1917 Gross Tons
Ferromanganese	9,787	3,402	58,474	38,875
Ferrosilicon	550	920	5,071	7,807
All other pig iron	5,394	3,926	34,251	16,675
Scrap	6,340	5,437	47,772	167,226
Bar iron	953	192	6,745	2,097
Structural iron and steel	13	1,311	1,081	4,056
Steel billets without alloys	163	2,620	3,298	28,525
All other steel billets	4,055	1,138	11,474	6,046
Steel rails	862	905	24,438	6,400
Sheets and plates	94	142	1,311	1,334
Tin and terne plate	51	.....	826	124
Tin scrap	.....	a608	.....	a6,102
Wire rods	295	203	3,284	516
Totals	28,557	20,804	203,025	285,782

a Not separately enumerated prior to July 1, 1917.

Exports of Machinery

	September		Nine Months	
	1916	1917	1916	1917
Adding machines	$83,617	$197,264	$1,040,486	$1,688,667
Air-compressing machinery	119,178	139,968	632,733	788,425
Brewers' machinery	404	1,803	11,729	96,899
Cash registers	83,154	49,497	1,254,263	668,322
Parts of	5,176	3,353	108,886	60,753
Concrete mixers	.....	a24,062	.....	a47,906
Cotton gins	12,438	4,726	73,704	69,155
Cream separators	24,087	31,883	370,449	467,976
Elevators and elevator machinery	245,650	270,588	1,374,419	1,671,392
Electric locomotives	18,831	33,081	395,873	353,372
Gas engines, stationary	25,765	84,811	274,494	663,965
Gasoline engines	909,458	2,598,347	12,165,657	17,881,778
Kerosene engines	.....	a256,541	.....	a662,946
Steam engines	759,379	4,873,008	8,278,243	22,924,606
All other engines	471,654	101,809	3,926,284	3,068,784
Parts of	1,548,693	.....	7,859,717	b9,287,245
Boilers	.....	a362,334	.....	a868,978
Boiler tubes	.....	a566,415	.....	a1,605,792
All other parts of engines	.....	a1,502,040	.....	a4,136,999
Excavating machinery	.....	a94,726	.....	a179,778
Milling machinery, flour and grist	109,434	124,317	1,807,979	645,671
Laundry machinery, power	29,118	25,784	241,532	319,825
All other	51,998	26,293	198,459	201,561
Lawn mowers	11,463	21,816	182,182	166,563
Metal-working machinery (including metal-working tools)	7,901,328	.....	63,218,202	b44,604,259
Lathes	.....	a2,371,629	.....	a5,552,621
Other machine tools	.....	a1,006,481	.....	a2,561,601
Sharpening and grinding machines	.....	a765,492	.....	a1,614,204
All other metal-working machinery	.....	a3,022,107	.....	a6,722,118
Meters, gas and water	18,768	725,640	289,839	1,048,991
Mining machinery, oil well	102,700	124,282	1,542,320	1,015,341
All other	680,240	876,196	4,949,977	8,182,779
Paper mill machinery	81,028	197,978	607,013	1,480,669
Printing presses	170,002	174,807	1,430,045	1,309,079
Pumps and pumping machinery	549,121	599,479	4,072,779	4,576,773
Refrigerating and ice-making machinery	60,676	59,662	544,615	835,144
Road-making machinery	.....	a39,486	.....	a91,655
Sewing machines	465,424	857,449	4,209,705	5,925,642
Shoe machinery	119,721	176,512	786,171	1,187,715
Sugar-mill machinery	1,173,993	659,132	4,202,165	5,195,582
Textile machinery	220,618	358,415	2,609,985	2,540,256
Typesetting machines	85,630	52,861	878,181	831,532
Typewriting machines	905,932	493,106	8,243,380	7,199,319
Windmills	46,779	115,219	808,577	830,750
Wood-working machinery, saw-mill	30,637	29,868	321,352	441,022
All other	68,450	101,280	677,183	812,174
All other machinery and parts of	3,317,911	3,746,597	28,981,718	30,739,295
Totals	$20,508,455	$27,947,134	$168,570,287	$203,727,900

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

Exports of Iron and Steel

	September		Nine Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Pig iron	64,122	.....	302,504	b377,094
Ferromanganese	.....	a57	.....	a1,139
Ferrosilicon	.....	a1,116	.....	a4,329
All other pig iron	.....	a43,114	.....	a133,207
Scrap	36,519	1,459	158,352	136,243
Bar iron	6,948	3,099	59,193	39,561
Wire rods	10,793	15,893	118,377	115,574
Steel bars	64,169	47,577	588,753	470,778
Billets, ingots and blooms, n.e.s.	163,104	148,932	1,051,669	1,478,640
Bolts and nuts	2,565	2,317	21,916	205,152
Hoops and bands	4,556	5,079	34,146	41,695
Horseshoes	837	3,304	7,043	6,417
Cut nails	877	604	3,672	3,020
Wire nails	15,369	9,777	114,710	74,221
Wood screws	.....	a276	.....	a856
All other nails, including tacks	1,686	1,543	7,764	14,566
Cast-iron pipes and fittings	7,558	7,289	49,931	55,182
Wrought pipes and fittings	17,724	12,592	111,238	98,177
Radiators and cast-iron house heating boilers	226	407	1,858	4,424
Railroad spikes	1,579	2,605	20,140	15,413
Steel rails	86,676	34,387	391,449	372,979
Galvanized iron sheets and plates	7,652	7,064	62,775	65,034
All other iron sheets and plates	2,869	4,927	34,305	44,302
Steel plates	24,385	42,487	196,494	397,980
Steel sheets	9,677	11,264	77,787	104,892
Ship and tank plates, punched and shaped	.....	a3,916	.....	a6,960
Structural iron and steel	29,336	21,156	211,869	222,468
Tin and terne plates	18,769	11,596	179,126	128,056
Barb wire	42,404	28,989	341,919	138,904
All other wire	23,363	16,589	211,566	146,647
Totals	643,763	489,415	4,358,189	4,525,871

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

1917, and for the two nine months' periods are given in the accompanying table.

Exports of iron and steel for which quantities are given aggregated 489,415 gross tons in September, 1917, as compared with 643,763 for September of 1916, when the high record in this class of shipments was scored. For the nine months ended September, 1917, these shipments aggregated 4,525,871 as against 4,358,189 for the same period of 1916. The accompanying table shows the exports for September and for the nine months ended September, 1917, as compared with 1916.

The imports of September show a decline as compared with those of 1916, decreases being noted in receipts of ferromanganese, and other pig iron, scrap and steel billets.

W. L. C.

German Supply of Iron and Manganese Ores

The iron and manganese ore situation in Germany is outlined as follows in the London *Ironmonger* as gleaned from German papers: Interruptions of imports have produced a shortage of certain grades of ore, but it is claimed that there are sufficient supplies of the principal kinds. There is a shortage of high-grade manganese ores and the manganese supply office cannot meet all requirements. According to the report of the Siegen District Ironstone Association the output, owing to the shortage of labor, has not shown the hoped-for increase in recent months. Manganiferous ore from Hesse and Nassau is coming into greater use but it does not entirely fill up the breach. There is plenty of phosphoric minette ore from Lorraine, Luxemburg and the occupied districts. Stocks of Swedish ores are sufficient and there have been no interruptions worth mentioning in their importation. Pig-iron production has been maintained at a height corresponding to the ore supply. An export of 70,000 to 80,000 tons is possible in phosphoric kinds; quality pig iron, on the other hand, only suffices to meet the home demand and is scarce.

The Seneca Electric Furnace Corporation, Albany, N. Y., has filed notice of change in its company name to the Ludlum Electric Furnace Corporation.

Skilled Workmen Needed

The Army Air Service needs more skilled workmen behind the lines abroad. These men will be recruited continuously, beginning immediately, until March 31. A. J. Baldwin, president of the Associated Business Papers, Inc., New York, has appointed a special committee which is co-operating with the War Department in obtaining enlistments. The air fighters need the backing of skilled men to keep every airplane ready for instant and constant service, and six men are needed on land to keep one airplane in the air, to bring up supplies, ammunition, food, clothing, to construct and maintain airdromes and to make repairs. Picked men who are being enrolled from various classes of skilled workers will be given special training and there is a chance for them to become non-commissioned officers. Among the skilled workers badly needed are mechanicians, engine repair men, electricians, machinists, blacksmiths, metal workers, automobile engine testers, welders, molders, propeller testers and tool makers. All interested are requested to address Edgar Z. Steever, Major Signal Corps, War Department, Washington.

Youngstown Sheet & Tube Co.'s Safety Rule Book

A new edition of the book of rules and instructions has been recently issued by the Youngstown Sheet & Tube Co., Youngstown, Ohio. General rules applying to all of the departments are set forth, followed by others having particular bearing upon the different departments of the plant. Each of these sets of rules are subdivided where necessary to take care of the different sections in any one department of the works. Rules for emergency work and instructions for resuscitation are given, the latter being supplemented by a list of the places where different pieces of emergency apparatus are stored. Mention is made of the relief association that is maintained by the employees for their benefit.

Puddlers' Wages Advanced

Wages of puddlers employed in bar iron mills in the Central West that sign the Amalgamated scale will receive $13.80 per gross ton for boiling for November and December, an increase of 50c. per ton over the rate for September and October, which was $13.30. Finishers receive an advance of about 4 per cent. The rate of $13.80 per ton for puddling is much the highest ever paid in the history of the bar iron industry. This rate of $13.80 per gross ton for boiling will also be paid by A. M. Byers & Co., having large puddling mills at Girard, and also by the Youngstown Sheet & Tube Co., which has puddling furnaces at Youngstown, Ohio. However, neither of these concerns signed the Amalgamated scale, but always pay that rate or higher.

Opposed to Negro Labor

MILWAUKEE, WIS., Nov. 5.—As the result of the influx of negro labor from the southern states, which in recent weeks has assumed large proportions, the Milwaukee County Council of Defense, co-operating with employers, will make an organized effort to discourage further importation of such labor, for the reason that investigation shows that there is plenty of labor in Milwaukee, but a readjustment is required.

Francis S. Peabody of Chicago has been appointed by Secretary of the Interior Lane as assistant to the Director of the Bureau of Mines in enforcing the provisions of the act regulating the manufacture, sale, storage and use of explosives. Mr. Peabody is a prominent coal operator and is chairman of the committee on coal production of the Council of National Defense. The new law provides for a maximum fine of $5,000 and imprisonment for one year for the unauthorized possession of explosives.

Phases of the Acid Open-Hearth Process*

Proper Condition of Bath—Influence of Lime — Temperature, Dead Melting and Role of Deoxidizers—Ingots Large End Up

BY DR. F. ROGERS

PERSISTENT mystery and some ignorance continually enshroud steel-making, especially by the acid open-hearth and crucible processes. Many of the views and suggestions in this paper will have a direct or indirect bearing upon steel-making by all the six usual processes. Attention has been centered upon the acid open-hearth process, partly because for a number of years acid open-hearth steel has remained in this country a standard of reference for quality among structural steels, and because the metallurgy of this process offers a convenient starting point for the study of all the steel-melting processes.

In all the oxidizing processes it is essential at the end to deoxidize the metal by some means. The prime and inadmissible effect of neglect to do so is blowholes in the ingot. There is also considerable evidence which suggests, but as yet does not prove beyond doubt that, besides the oxygen in some form and hydrogen and nitrogen, further gas, including oxygen, remains in combination or solution in the steel to its detriment.

Two principal methods are in use which contribute to secure the desired end. The first is the bringing of the bath to proper condition toward the end of the melting process; this factor assumes exceptional importance in the acid open-hearth process. The second is the use of deoxidizers.

Proper Condition of the Bath

The term "condition" is often abused in its application to steel-melting, being used in a vague and mysterious manner, frequently to cloak ignorance. It is true that it is not yet possible to keep the working under the continuous control of instantaneous precise measurements, but there is every reason why this fundamentally important condition should be as fully understood as possible. What is meant by the condition of the bath is properly its temperature, the composition (particularly the carbon and oxygen contents) of the metal, and the composition (particularly the iron oxide content) of the slag.

There are many considerations involved in judging the condition during working. After the adjustment of the carbon content is well in hand, the deoxidation of the metal should occupy first place. The diminution of oxygen in the metal is indicated by the appearance of the sample and by the quieting down of the reaction, in conjunction with the carbon content of the metal, the composition of the original charge and slag so far as known and the temperature.

Dead melting means the minimizing of oxygen in the metal at this stage. The influence of temperature in dead melting is usually misunderstood. The reaction between iron oxide and carbon in the bath proceeds further in the direction of minimizing the total iron oxide present, as the temperature is raised. On the other hand, the rate of oxidation of the bath by the furnace atmosphere increases with the temperature. In practice, however, under ordinary conditions, the author has found that the balance is strongly in favor of the higher temperature. No satisfactory figure for the temperature can be given, since the means of measurement hitherto available are always open to an error of 20 to 30 deg. C., and this amount is sufficient to make the difference between good dead melting and bad.

Fig. 1, with its legend, illustrates this point. It has already been mentioned that it is important to minimize the small amount of oxygen which remains in the metal. The foregoing remarks, however, would apply equally well if we were merely contemplating the minimizing of oxygen in the slag, but in some of the following remarks this would not apply, and it may therefore be taken that the author considers oxygen as being present in the bath (and in the solid steel) in small amounts as dissolved iron oxide.

The bearing of these views, however, is less clear unless it be realized that he considers that when dead melting is achieved, there is an appropriate equilibrium involving the retention of an amount of iron oxide in solution, in the molten metal, which is quite a definite amount in relation to the other factors involved (temperature, carbon principally, in presence of iron, silica principally). The equilibrium here referred to is not a stationary condition, but the reaction still continues, in passing through this condition.

The Influence of Lime

The influence of lime (if present) in this equilibrium, should be mentioned for the sake of completeness. Its addition causes in effect the displacement of some iron oxide, although the entire slag remains an approximately homogeneous solution, which reacts with carbon in the metal, thus lessening the total iron oxide in the system. The effect is slightly increased because the distribution of iron oxide between slag and metal will upon well-understood physical and chemical grounds be proportioned to the total iron oxide present—that is, the addition of lime does not merely lessen the iron oxide in the slag, but also lessens the iron oxide in the metal correspondingly. The diagram represents this:

Effect of Adding Lime

$FeO - SiO_2$	Slag	$\left.\begin{matrix}CaO\\FeO\end{matrix}\right\} - SiO_2$
$FeO - C$	Metal	$FeO - C$
Before adding lime		After adding lime

It is evident from this explanation of the action of lime that when, as often happens, the nature of the charge and other conditions are such that the early addition of lime is not essential, it is sufficient to add lime at a late stage, in approaching the dead melted condition. The above-described reaction then occurs, and a satisfactory dead-melted condition is attained in from 20 to 60 min., according to various other circumstances.

Dead melting is a relative expression, and it is important to inquire what happens if this condition be over-stepped in any way. At this stage the reaction may be comparatively slight—for example, a drop of 0.01 per cent carbon in ¼ hr.—or rapid—a drop of three to five times as much—yet with satisfactory results. Reference to Fig. 1 will show what may happen next: We may in the extreme case have the rate of production of iron oxide by furnace atmospheric oxidation greater than the rate of its decomposition by carbon, and the carbon being low, the metal becomes increasingly charged with iron oxide. It is probable that the solubility of iron oxide in the metal increases slightly as the temperature rises and as the carbon decreases beyond some very low figure. It is further probable that the solubility of each of the gases decreases continuously with rise of temperature from the melting point, but drops suddenly in solidifying.

Reference to Fig. 2 will now show in a simple form one of the principal features extracted from Fig. 1, namely, the curve of excess oxygen present—the oxygen in the bath as a whole which is in excess of what can be removed by the reaction with carbon.

We can now see the several conflicting factors which enter into the proper deoxidation at this stage—the chances of underdoing it on the one hand, and leaving

*From a paper presented at the annual meeting of the Iron and Steel Institute, London, England, Sept. 20, 1917.

the steel considerably oxidized, though not markedly wild which is the commonest error, or, on the other hand, overdoing it and producing wild steel, which is not in all circumstances fully cured by the use of deoxidizers. Thus, for example, it is useless to make a rigid practice, as the author has known to have been done, of running the carbon down to 0.07-0.09 per cent in all casts, with practically no reference to condition in other respects, and then to imagine that this is dead melting because a lot of pigging-back was done. At 0.09 per cent carbon the bath is usually underdone, because a relatively high temperature is required to dead-melt at this carbon.

Incidentally, a relatively slight excess of temperature would, under these circumstances, lead to wildness; but with care in approaching 0.09 per cent carbon there is no difficulty in obtaining a good dead-melted condition at this carbon if necessary.

Another extreme instance is the attempt to catch the carbon at say 0.45 per cent carbon, including obtaining three or four successive samples in ½ to 1½ hr., all analyzing 0.45 per cent carbon. This can be done, and sometimes is approximately, but it is not to be imagined that this is properly dead-melting. The bath has in such a case been held quiescent by its coldness, and the diagrams show that, under these circumstances, its oxygen content is higher than it should be before going on with the additions. Incidentally, a relatively great excess of temperature, and even a first addition of lime, need not in this instance do worse than cause the fall of the carbon to 0.25 to 0.30 per cent in 1 to 1½ hr. and produce a good dead-melted bath.

The diagrams here presented must be only of a qualitative nature. They have, however, been derived from a great variety of experiments arranged to test the various points at issue. It will be seen, for example, that a consequence of Fig. 1, as of some of the above-expressed conclusions, would be, that if the temperature of the bath could be promptly raised while keeping the other conditions (especially oxidation and carbon addition) as stationary as possible, an underdone cast could be dead-melted or a dead-melted cast made wild. This is not, however, very well illustrated in the acid furnace, owing to the relative slowness of the heating, but the action is evidently exactly what should be made fullest possible use of, as mentioned in the foregoing instances.

On the other hand, it is possible to study this action in the reverse way—that is, by prompt cooling of the bath. The means by which the author achieved this was the addition of fairly massive scrap steel of similar class to the bath. If this be done when an ideal dead-melted condition has been obtained, then as soon as the

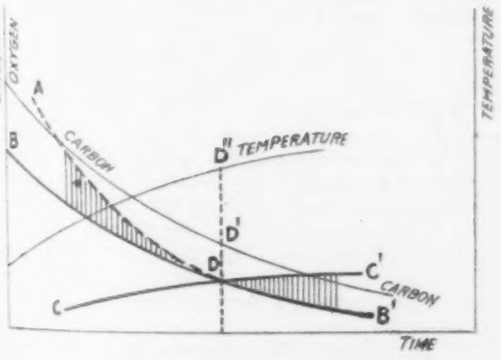


Fig. 1.—Dead Melting

Curve "Carbon" shows the bath carbon content (C) in relation to the time (t). Curve "Temperature" shows the corresponding temperatures. Curve BB' shows the oxygen (O) taking part in the reaction FeO + C = Fe + CO; the equation of the curve is $O = -\frac{16\,dC}{12\,dt}$. Curve CC' shows the oxygen entering the slag from the atmosphere. CC' and BB' intersect at D. Curve AD shows the total oxygen present in the bath previous to D. The curve AD frequently meets BB' elsewhere than at D.

The part of the ordinate intersected between BB' and ADC' represents the oxygen in the bath in excess of that taking part in the reaction FeO + C = Fe + CO. These intercepts are plotted separately in Fig. 2.

The ideal consists in dead melting to "condition D," that is:

Oxygen D, all in course of removal by reaction FeO + C.
Carbon D.
Temperature D".

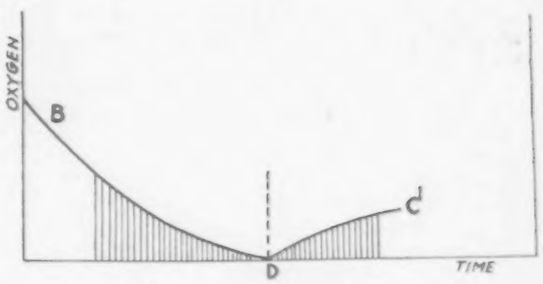


Fig. 2.—Dead Melting

The ordinates are oxygen in excess of that taking part in the reaction FeO + C = Fe + CO, as obtained from, and explained under Fig. 1

scrap addition is melted and mixed in, the bath shows the usual signs of coldness.

Adding Scrap to Correct Wildness

Again, if a good dead-melted condition be exceeded, and by pushing the temperature too high in relation to the other conditions, a somewhat wild bath is obtained, the addition of the correct amount of scrap restores a perfect dead-melted condition. The author is not advocating the indiscriminate addition of scrap for the control of condition in dead melting; to do so might cause more mischief than it would remove. Further, he does not make a sweeping claim of novelty in adding scrap (or anything else) to the bath, which has often been done by others, especially in the final additions; but he is not aware that it has been used in exactly the way above described in the study of the essential condition of the bath. It is one of the most valuable methods of study and it has assisted him in arriving at a decision as regards several of the more obscure features of the subject.

In the attempt to end the oxidizing stage satisfactorily, it is from the practical point of view necessary not only to minimize the oxygen present in the system, but also to do so with the carbon content within reasonable limits of a desired figure—which varies considerably with the circumstances. The nature of the running equilibrium has been indicated, and it is therefore evident that some careful choice must be exercised in regard to the controllable excesses which may occur. In this respect we have to notice chiefly temperature, carbon and iron oxide. The influence of temperature has already been discussed. The important point as regards carbon and iron oxide is to choose correctly the carbon content at which to cease oreing, so that in view of all the particular circumstances then prevailing (approximate ore content of the bath, the relative keenness of working of the furnace, the general nature and volume of the slag, etc.) dead melting will be achieved at a convenient carbon content.

Deoxidizers, and Temperature Effect

What is the advantage of such great care in deoxidizing the bath by dead melting when deoxidizing additions are afterward to be used? The author has found by wide and careful experiments that no one deoxidizer will alone thoroughly deoxidize steel, and that when two or more deoxidizers are used, each has an effect, and the combined effect is greater than if one of them be omitted. The fact that carbon alone is not sufficient to deoxidize steel demonstrates the truth of this conclusion.

Manganese dissolves in the metal in some form and produces manganese oxide, which unites with avidity with silicates, but which is at most slightly soluble in the metal. A part of the manganese also unites with sulphur, producing an insoluble sulphide. The action of silicon resembles that of manganese—it is partly dissolved in some form and produces insoluble silica, whose assimilation by the silicates and basic oxides is not so ready as the combination of MnO with the silicates. Aluminum enters only to a very slight extent into the metal, and produces an oxide which frees itself fairly readily from the metal, but which does not readily associate itself with the other non-metallic matters. Despite the presence of some manganese in solution in the molten metal, a certain amount of FeO

and CO still remain dissolved and even unacted upon by manganese.

The deoxidizers are more efficacious, the higher the temperature of the metal at the time of their addition. The effect of higher temperature and time in giving the entangled products greater opportunities to float to the top is generally recognized. The casting conditions which have to be met are, however, usually permitted to dictate the temperature control as the end of the process is approached. Throughout, the process is admittedly full of such compromises, but the present is a plea for ideals accompanied by suggestions as to how to attain them, and even in the last-mentioned stage, the author much prefers to see the attempt made to get the maximum deoxidation as stated, followed by temperature control, or even by modification in the details of casting to obtain the required ingots.

The Casting Stage and the Defects

Approaching the casting stage metallurgical generalizations are not so readily applicable to the whole field. Much good steel is more or less ruined in the pit in casting. Three of the principal types of original defects in steel are rokes, non-metallic inclusions, and pipe. Rokes which do not contain silicious matter may arise in mechanical ways in worked steel, but more generally they arise from blowholes in the ingot. The means which have been outlined for minimizing oxygen are the prime means for obviating rokes arising from blowholes. Blowholes usually local in the ingot (that is, not related to the general anatomy of the ingot) can also arise through wrong design of ingot, bad surface or facing of mold, etc. Non-metallic inclusions arise in various ways:

Entangled slag and silicates or MnS in suspension in the bath and carried over to the ingot.

Silicates formed *in situ* in the ingot by a continuance of the deoxidizing action and aided by oxidation of the steel by air during its passage into the mold.

MnS formed *in situ* by continuance of the action of manganese in the ingot during solidification.

Fluxed refractory fittings, especially runner bricks.

The influence of high temperature and time in lessening the first has already been noted. As regards the second and third, there is a slight advantage in hot steel; the fourth is a strong argument for avoiding bottom running if possible.

Steel made on the lines indicated will have the greatest tendency to piping, but it is always possible to minimize this tendency systematically. Refractory lined heads and ingots wide end uppermost are the simplest and most direct methods.

The full advantages of casting ingots wide end up are, for the greater range of ordinary work, best obtained from a mold standing on a loose bottom plate, preferably with a well for sizes over 3 tons or so, containing a loose but fairly massive piece of scrap plate for the stream to strike upon first. If this loose piece be adopted, it is essential that every loose piece absolutely should be identified afterward for each ingot, since sometimes I have known this plate, if too light, to be washed up into the ingot and cause trouble.

New York State Safety Congress

The Second Industrial Safety Congress of New York State will be held at Syracuse, N. Y., on Dec. 3, 4, 5 and 6, under the auspices of the State Industrial Commission. The program calls for the discussion of set topics at the morning sessions, with round table discussions in the afternoons. The evenings will be given over to illustrated talks. Some of the topics to be considered are "Safety from an Economic Standpoint as Well as a Humanitarian Proposition," "What Part Does Labor Play in the Safety Movement?" "Disciplining Careless Workmen—How the Employer Feels About It and How the Employee Feels," and "Safety Committees, Their Scope and Benefit." The headquarters of the congress will be at the Hotel Onondaga and the safety exhibit in connection with the congress will be held there. The sessions of the congress will be at the First Baptist Church, where they were held last year.

Suggestions for Conserving Coal

WASHINGTON, Nov. 13.—A series of suggestions addressed to owners and managers of power plants for the economical use of coal has been prepared by the committee on coal conservation of the Chamber of Commerce of the United States, which is working in conjunction with the Council of National Defense. The cost of coal for the generation of power, the committee points out, has in many instances not had the same consideration as other costs because coal has been cheap and abundant, so that cheap coal and cheap labor sometimes made it apparently economical in dollars and cents to install and operate an inefficient plant. Coal and labor are now expensive and conditions make it imperative for every owner or manager of a power plant to examine into the cost of the power his establishment uses, the economy with which it is generated and applied and the increase in efficiency that is possible.

Most users of coal can join in promoting efficiency of coal. Railways have made real progress in firing locomotives; they can often go farther. Gas workers can generally effect further saving by using careful technical direction. Manufacturing plants of every degree can show great results in the aggregate.

The Bureau of Mines, on behalf of the Federal Government, has gathered a great deal of information about the use of coal and has expert advice to give regarding means of economy. Several publications, in which the Bureau of Mines has embodied the results of its experiments and made practical suggestions based upon expert observations and conclusions of its staff and other engineers, are now available and a list can be obtained by application to Director Van H. Manning.

Bethlehem Steel Corporation Need Not Show Books

Justice Goff, in New York, Nov. 9, denied the application of the General Investment Co. for an inspection of the books of the Bethlehem Steel Corporation, in which the petitioner owns 100 shares of common stock. It was alleged that the Bethlehem company had illegally paid bonuses amounting to $8,000,000 to officials and employees of the concern. It was alleged that of this amount Eugene G. Grace, its president, received $1,000,000.

The proceeding before Justice Goff brought out the statement by counsel for the Bethlehem Steel Corporation that Clarence H. Venner, banker, who has figured as plaintiff in many actions against corporations, was the head of the General Investment Co., and had brought the action merely as a "fishing expedition."

The defendant's attorney said that Mr. Venner bought 100 shares of Bethlehem stock, a small proportion of the entire outstanding issue of common stock. After heckling Charles M. Schwab, chairman of the Bethlehem board of directors, at the last annual meeting, he voted the 100 shares against the granting of the bonuses. The number of shares voted in favor of the bonus plan numbered 238,398. It was argued for the Bethlehem company that no favoritism in the distribution of bonuses is shown to persons holding stock, but the bonuses are given for good service, the man on the scrap heap and the man in charge of submarine construction for the Government sharing with heads of departments and salesmen, who have earned a bonus.

Counsel for the General Investment Co. denied that Mr. Venner was connected with it.

The Barrett Co. has acquired the plant of the All-Roofing Co. at East St. Louis, Ill., and will enlarge the plant and make it the central manufacturing plant for the central west of the company. The company which it has acquired is capitalized at $100,000 and has on hand contracts for the Government aggregating approximately $1,000,000. Vice-President Thomas M. Rianhard and W. D. Harris of New York City acted for the Barrett Co. in closing the deal.

LIBERTY BOND CAMPAIGN

Interesting Details of Successful Efforts of a Youngstown Company

During the week ending Oct. 24 the Youngstown Sheet & Tube Co. conducted in its works at Youngstown, Ohio, a campaign for the sale of Liberty bonds to employees which was so phenomenally successful as to arouse general interest in the methods used. Some of the ideas will probably be adopted by other companies in later campaigns.

During the period mentioned 8,893 employees became subscribers to the second Liberty loan, taking an aggregate of $1,064,300 worth of bonds. In addition to this the company subscribed for $2,750,000 worth of the issue, making a total of $3,814,300 taken by the corporation and its employees. This remarkable result was in addition to subscriptions to the first Liberty loan on the part of the company and employees amounting to $3,875,000, and the purchase of short-term certificates by the company in the interim to the amount of $4,000,000, which bring the total amount of Government securities absorbed by this institution and its employees to date up to $11,689,300.

Subscriptions to the first Liberty loan by its employees, having totaled $610,000, the company decided to increase this amount on the second loan if it was at all possible. That this could be done seemed doubtful, since about half of the installments on the first purchases were still unpaid. The fact that of the 13,500 employees fully 60 per cent are of foreign birth, and many of them from enemy countries, was also expected to add to the difficulty of increasing the subscriptions. Nevertheless, the officials decided to make the effort and a campaign was carefully planned with the idea of bringing the total up to $1,000,000.

Subscribing Made Easy

The first step was to provide an easy method by which the employees could pay for the bonds out of their earnings, which were about to be increased by a 10 per cent advance in wages, and this was given much thought by the officials. It was finally decided to use the same plan as in the case of the first loan, but to add to new subscriptions the unpaid balance on the old, deducting from earnings of the subscribers 10 per cent of the total amount each month. This gave subscribers to the loan the opportunity to pay for a part of the first subscription during 15 months, instead of 10. A clause was also inserted in the agreement by which the company agreed to complete subscriptions up to $100 and turn over the bonds to heirs in case of the subscriber's death before the term of payment had been completed. This provision was also made to apply to $100 on all subscriptions of larger amount. It was also provided that subscribers could withdraw their subscriptions at any time, or in case of sickness, have the time of payment extended.

When this plan was finally formulated, posters and booklets in seven different languages were printed and distributed to all the employees in the works. These languages were English, Slavish, Hungarian, Polish, Italian, Rumanian and Greek, from which fact the cosmopolitan nature of the group can be judged.

Superintendents Organized

Next an organization was formed among the superintendents in the works, and they were instructed to select committees, including their foremen and the more progressive workmen of foreign birth in their departments. When this had been done all these men, about 350 in number, were called together at the time day and night shifts were changing, and addresses made to them by officials of the company and a speaker brought in from outside.

In the meantime 10,000 Liberty loan buttons had been secured, and these, with subscription blanks, were placed in packages and distributed among the workers, each being given a button and blanks for every man in the department which he was to cover, different workers being selected for day and night turns. The campaign had been arranged to begin in the middle of the week, so that the day and night shifts, which alternate weekly, could both be reached.

The work was under the general direction of C. S. Robinson, vice-president; W. C. Reilly, general superintendent, and E. T. McCleary, assistant general superintendent. The details were handled under direction of R. M. Welch, special agent, and the campaign was conducted through the Industrial Relations Department, which had instructions to complete the canvass in seven days.

Even with this elaborate organization it was impossible to see every man in the plant, but nearly all were seen and solicited to invest their savings in the Liberty loan. The campaign as conducted under this organization involved considerable expense, and extra accounting is involved, but the result eminently justified this.

Wise Expenditure

The officials of the Youngstown Sheet & Tube Co. believe the expenditure of time and money to have been fully justified, not only on patriotic grounds, but also because the purchase of bonds results in closer relations between the company and its employees, and offers them an opportunity for saving their earnings such as could be found in no other way. Of all the bonds taken, only about $13,000 worth were fully paid for in cash. The greater portion of the remaining amount will prove to be actual saving by the employees during the period of payment. The company will, of course, purchase the bonds and hold them until they are paid for, but will deliver to all subscribers to the first loan the bonds then taken as soon as the aggregate deducted from earnings is sufficient to pay for that amount. These bonds will be of the 4 per cent denomination in all cases where the subscribers so desire.

Speaking of the extraordinary inducements offered by his company to its employees subscribing for Liberty bonds, President J. A. Campbell said:

"We were inspired chiefly by the desire to see our employees express their patriotism and aid the Government at a time when every citizen should keenly feel his obligations in that direction.

"Nevertheless, this large subscription to the bond issues will prove immensely to the advantage of our people and will be well worth the labor and expense involved. Our employees have been encouraged to save some of their large earnings against the time when it may be impossible for the industry to maintain these earnings at their present rate, and they will thus get permanent benefit from the prosperity they are now enjoying. High wages benefit no one if they are spent unnecessarily, and the best citizen for himself and for everyone else is the one who makes a serious effort to provide a competence for his family.

"This campaign has accomplished for some of our employees what could not have been done by either our regular relief fund or our housing propositions. It has given them a motive and an opportunity for saving while they can do so, and at the same time it has made them better citizens and better workmen.

"I naturally feel proud of the record that has been made in our plant, and congratulate our employees and those who were in active charge of the campaign."

Soot Blowers for Army Cantonment in France

The boilers installed in connection with the heating and refrigerating systems in the first American cantonment in France will be equipped with soot blowers made by the Diamond Power Specialty Co., Detroit. The units, a large number of which will be installed, are of the front-end type, in which the entire mechanism is attached to the door and swings out with it when the door is opened. In this way the boiler ends are readily accessible for inspection or repairs, and is also possible to get at the blower easily. The blower proper consists of a revolving arm which is moved by a wheel on the outside of the boiler and discharges jets of steam in a path parallel to the tube walls.

Enlarged Activities of Bureau of Mines

Popular Report Telling Story of Iron to Be Issued—Special Investigations as to Safety, Corrosion and Slag

WASHINGTON, Nov. 13.—An interesting summary of the metallurgical work of the Bureau of Mines during the past year and a comprehensive forecast of greatly enlarged activities of special importance to the iron and steel trade during the coming year are the salient features of the forthcoming annual report of the director. With a prospect for materially increased appropriations for this particular branch of the Bureau's work, it is believed that its usefulness to the industry will be very greatly increased.

As a general basis for public understanding of the iron industry, and to serve in answering many of the questions coming to the bureau from all sides regarding the fundamentals of the industry as a whole, a popular report entitled "The Story of Iron" has been practically completed and will be published in the near future. The report aims to cover the general history and evolution of the iron industry. The work is both historical and technical and notes the progressive steps and methods in the development of iron manufacture with special reference to the United States; it also cites various noteworthy discoveries improvements, and processes.

Investigation of Safety in the Industry

In conformity with the bureau's general policy of promoting safety and welfare in the industries which it touches, it has been making a study of accidents at iron and steel plants with a view to determining the principal causes of such accidents and to developing equipment and practice to lessen them.

The investigation of accidents and of safety devices at blast furnace plants has been finished. It has necessitated much travel—all districts of the country, with the exception of the Colorado district, having been visited at least once—many interviews with men managing, operating, and working at the various blast furnace plants, the compiling of considerable information on operating and constructional features, the study of hundreds of accidents, and the observation of furnace methods and practice. The result of this investigation is represented in four reports, two of which (Safe Practice at Blast Furnaces and Asphyxiation from Blast-Furnace Gas) have already been published. The third report treats in detail of Blast-Furnace Breakouts, Explosions, and Slips and will be published at an early date. The fourth report, which will appear later, represents the findings of an investigation undertaken in co-operation with the Pennsylvania Department of Labor and Industry on the hazards at furnace plants in that state. This report embraces an analysis of the accident risk and suggests methods and means of prevention. The report takes up the entire field of accidents about blast furnaces and every type of accident is illustrated by the description of an actual occurrence, together with the discussion of the means best calculated to prevent it.

Co-operation of Public Health Service

To aid in improving hygienic conditions, a plan was formulated for the investigation of the health of workers in the steel and metallurgical plants of the Pittsburgh district. Seven of the largest and most representative steel plants, employing approximately 35,000 men, were visited. A general survey of each plant was first made and data were collected on such subjects as the sanitary condition of the plants as a whole, the character of the work performed by the employees, the amount required, and the conditions under which it was performed as far as each of these might affect the health of steel workers. A detailed study was then made of each condition observed that might injuriously affect the employees' health, with a view to devising ways and means by which these health hazards could be eliminated or minimized. A report has been prepared for publication and will appear at an early date.

Corrosion Investigations

The corrosion of metals is receiving constantly increasing attention in the metallurgical world on the part of both the manufacturer and the user. "For a time," says the report, "we were inclined to believe that modern conditions of service and the demand for production by present-day methods made short life inevitable. Fortunately scattered examples of long-lived products, and the activities of certain investigators and producers showed that improvement in material was within the bounds of probability. Such improvement has been marked within recent years, and it seems likely that we have by no means reached the limit of advancement in quality. Again, the better understanding of the underlying causes of corrosion is opening new avenues of attack for solution of the problem.

"That the rusting of iron and steel is one of our serious economic and conservation problems is now generally admitted. If we assume an average life of steel of 33 years, the depreciation charge of 3 per cent represents in this country a yearly loss of 1,000,000 tons of product, valued at $30,000,000 to $40,000,000 for the crude or semifinished material alone, exclusive of correlated fabricating costs. The inevitable rusting of steel may be justly claimed to be the bulwark of the zinc industry, as 60 per cent of the metallic zinc used in this country is for galvanizing iron and steel articles, representing an annual outlay of $20,000,000 in an endeavor to protect metals from inevitable decay. Enormous amounts of paint are used in a like endeavor. About 5,000,000 tons of coal is needed in the production of steel to replace the annual waste and 1,000,000 more for the zinc that is annually lost.

Nature of Corrosion of Metals

"The mechanism of corrosion is of extreme importance as underlying any investigation of the problem. Its study involves research of an electrochemical and metallographic nature. This phase of the problem has of late years received the minor share of attention, partly because the commercial interests are primarily concerned with tests that will prove superiority for their particular products and partly because the electrolytic theory of corrosion has been rather generally accepted, and in consequence most investigators have assumed that the scientific aspects of the problem were largely solved.

"The electrolytic theory of corrosion is based on simple and well-understood principles; their application to corrosion phenomena involves modifications of detail only. * * * * One does not have to go far into the study of the corrosion problem to be forced to the conclusion that many of the actual facts observed in service tests are not satisfactorily accounted for by the usual interpretation of the electrolytic theory. For example, iron of highest purity should be most immune from rusting, and such rusting should be even in distribution, with absence of pitting. And yet pure iron does rust, and it does pit as severely as do impure products, especially in some service, as in water pipes.

"The work of the Bureau of Mines during the past year has been devoted to the study of the surface influences, particularly of the influence of rust once formed on the progress of further rusting. The findings have received the general approval of authorities on corrosion as explaining many of the hitherto seemingly anomalous observations, and especially the differences observed in the corrosion of pipe as compared with that of iron exposed to the weather, and the more pronounced

pitting common to iron pipe. In brief, the investigation has shown that rust once formed is a factor in the progress of rusting at least equal in effect to those factors universally recognized and is more important than many factors that are subject to dispute because of being attended with detrimental effects of considerable magnitude. It has been found that there is a reversal of polarity according as the rust is wet or dried.

"Some interesting work has been done during the past year in the detection of steel scrap in wrought-iron pipe of supposedly genuine character. Methods for such detection have been devised and will be described in a forthcoming report, so that the information may be used by consumers of pipe.

Slag Investigations

"On account of the growth and expansion of the iron and steel industry and of the industries which depend upon an abundant supply of iron and steel, there arose at the beginning of the last century an urgent need for greater economy and output in the operation of the blast furnace. The raw materials for the manufacture of iron must needs remain iron ore and coal; and with the exhaustion of the higher grade ores the industry is becoming confronted with the problem of profitably working leaner ores or ores that present unusual operating difficulties.

"In their preliminary survey of the field the metallurgists of the bureau chose as problems demanding scientific investigation the fluidity of blast-furnace slags and its relation to their chemical composition, and the mechanism and physical chemistry of the desulphurization process—two problems intimately associated with the realization of fuel economy and the production of high-grade pig iron.

The first phase of these investigations, the fluidity of blast-furnace slags, has for many years been the subject of much speculation and theoretical deduction by operating men and scientists. Prior to the present investigations there have been no reliable conclusions drawn because of the utter lack of experimental data relating to the problem.

Since the beginning of the investigation in November, 1915, the problem of slag viscosity has been successfully solved, so far as the method, apparatus and technique of measurement are concerned, by the development of the Feild high-temperature viscosimeter. By means of this apparatus the viscosity of slags is accurately measured up to a temperature of 2900 deg. Fahr., which is approximately 900 deg. higher than had been reached by previous investigations. The viscosity temperature relations of numerous typical commercial slags have already been investigated, and similar measurements of synthetic slags are under way to show the effect of the different constituents, particularly of magnesia, alumina, titanium oxide, manganese oxide and sulphur. As soon as these investigations are completed the study of the desulphurization of pig iron and its relation to the viscosity and composition of slags is to be undertaken.

Numerous slag samples have been collected from blast-furnace plants throughout the country, and these are being investigated with a view to applying the laboratory results to operating practice. The results of further research will be published from time to time as the experimental measurements accumulate.

It is earnestly hoped that the investigations designed to promote efficiency in the iron and steel industry, of which the present study of slags is the beginning, may be carried to their logical conclusion, and that the necessary funds and equipment may be made available for their continuance. W. L. C.

The Wagner Electric Mfg. Co., St. Louis, on Nov. 15 opened a sales office at 116 Auburn Avenue, Atlanta, Ga., in charge of Charles M. Welch, formerly Indianapolis branch office manager.

The Globe Iron Co., Jackson, Ohio, blew out its blast furnace last week for relining and repairs.

LABOR AND THE NATION'S WORK

Checks by Organized Labor Told by President of National Founders' Association

Since the United States declared war there have been called nearly 2000 strikes, according to William H. Barr, president National Founders' Association, in his annual address before the association at the Hotel Astor, New York, Nov. 14. If we understood all conditions accompanying these demands, he said, we would know that our Government, after only six months of hostilities, is sanctifying an industrial status of disastrous socialism similar to that from which England emerged only with a supreme effort, after two years.

Among the unfortunate examples of academic industrial theories reacting on manufacturers he mentioned an agreement between the Secretary of War and the American Federation of Labor entered into some months ago, an agreement afterward approved by the Secretary of the Navy as applied to shipbuilding and other naval construction. This agreement in substance is that any manufacturer accepting certain war contracts should be governed by union hours, wages and conditions at the time nominally in existence in his particular locality.

Very recently adroit union leaders, by intimidation or deceit, enlisted the co-operation of ranking Federal officers to the extent of inserting a unionization clause in contracts with steel corporations, an attempted embarrassment to the industry and a skillfully conceived plan which ultimately contemplates forcing every manufacturer to accept the entire labor union program.

Eight-Hour Day an Economic Waste

We recognize, he continued, that national emergency measures are now necessary, but "I disapprove the growing tendency toward waste, indicated by the Government in its drastic continuance of effort to impose the 8-hr. day. Some conditions of labor make the 8-hr. day advisable, but by far the greater number of occupations do not need such restrictions. Why then this Federal insistence of reduction in working hours when every nerve should be strained to support our fighting men? Do they battle at the front on an 8-hr. schedule? Does the Chief Executive encompass all his duties in 8 hr.? Can the farmer, without whose support the war cannot be won, increase the products of the soil by reducing his workday to 8 hr.? In wartime, particularly, the 8-hr. day is a luxury which must yield to the demands of national necessity. The conservation and development of America's manufacturing facilities must be equal to the demands of war."

Scheme to Unionize All Industry

One of the newer problems is presented in the U. S. Public Service Reserve, a division of the Department of Labor. The report of the Reserve is to register all persons available for emergency service by having the individual sign an application containing his address and answers to a variety of occupational questions. As a substitute for the existing distribution of labor by union representatives in the Public Service Reserve why not urge the creation of a non-partisan, absolutely impartial committee, divorced from the Department of Labor and free from antagonisms, who could handle necessary enrollment most equitably for all concerned and effect a reserve force both available and mobile to some degree?

Every effort should be made through this plan or some other to check the added unrest which will inevitably follow the present persistent effort of the Reserve staff to suggest temporary change of occupation without definite opportunity, to the steady, loyal, dependable workmen now in your shops.

The Automatic Sprinkler Co., Youngstown, Ohio, has bought some property adjacent to its plant, on which it proposes to build an addition to cost about $50,000.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Labor Union Foes

If Great Britain had suffered one-eighth as many industrial disputes in the last two years as my colleagues and myself have personally observed during the two months we have been in this country we should long ago have been forced to conclude a disgraceful peace with the Germans.

So spoke H. W. Garrod, a member of the mission of the British Ministry of Munitions now visiting in the United States, in addressing the Brooklyn Central Labor Union last week. Mr. Garrod would not have been far from the truth if he had added that judging from the attitude of organized labor shown in various strike outbreaks and in reported utterances of union leaders, there is a labor element in the United States that could even view with indifference the conclusion of a disgraceful peace between the United States and Germany.

The response of American Federation of Labor delegates to President Wilson's speech at Buffalo seemed enthusiastic enough and the counsel of some labor leaders to their followers sounds fair enough, but there is much that is disquieting in current labor developments. There has been a solemn enough compact between Samuel Gompers and others on the one side and the American public on the other side as represented in various Washington conferences, to the end that no changes in labor conditions, particularly as to open or closed shop, shall be forced under stress of war; but in actual practice the attitude of many representatives of organized labor has been far from keeping the faith President Wilson has repeatedly expressed in these promises.

The strike on shipyard construction work in New Jersey this week, to compel an erecting company to unionize its operations and abandon its long-standing open-shop policy, under threat of holding up the Government's shipbuilding program, is nothing less than traitorous. But it is exactly matched by the spirit of the strikers who are throttling shipyard work on the Pacific Coast, and that shown in repeated attempts to force the closed shop upon metal-working concerns having contracts with the Government. It is true that in some of the strikes of which much has been printed the workers have acted directly contrary to orders given by union officers. But the spirit of many leaders has been far from whole-hearted support of the pledges given the President. Witness this from the address of James O'Connell, president of the metal trades department of the American Federation of Labor, before the convention of the Boilermakers' Union at Kansas City. The extract is from the report of this address given in the *Boilermakers' Journal* for October:

In our country, we took advantage of the situation as we found it abroad, and before war was declared by the United States we saw to it that organized labor was going to get proper recognition and that conditions of employment and standards of living would not be interfered with, would not be lowered. *** Nothing can take place, nothing can be done, unless we are consulted and practically give our consent to it. ***

And so you are meeting now, my friends, and you will be expected before this convention adjourns to make a declaration as to what the position of the Brotherhood of Boilermakers, Iron Ship Builders and Helpers of America is, so that the world may know. It is not a mere question of being behind President Wilson. That is a sort of catchy expression, a catch phrase, sounds nice. The question is, are you behind yourself? If you are, you will say so before you leave here.

There is no misunderstanding the brand of loyalty thus described and the Kansas City audience of boilermakers could have had no doubt of the extent to which they might expect to discount public assurances by their leaders that all would stand behind the President. Such utterances and the tactics in line with them which have been all too large a factor in current labor news suggest a day of reckoning for men who are thinking of everything but their country's welfare in the gravest crisis in its history. Or is there ahead a fearful reckoning for the whole country as the result of such disloyalty as exists in the ranks of organized labor?

The various departments of the Government at Washington, having come to a realization of the necessity of co-operating with the business men of the country, are honestly endeavoring to do so, and with much better results than in the days when public men persistently sought to gain popular approval by antagonizing all corporations. Many important problems are being slowly but surely worked out. That there is, however, some of the old red tape left is shown by the slowness in paying bills

Indeed, recent reports indicate more than the usual amount of procrastination. Considerable speeding up of payments is in order.

Less Pig Iron But More Steel

The monthly statistics of coke and anthracite pig iron collected by THE IRON AGE show a production in the first ten months of this year of 32,097,271 tons, against 32,549,894 tons in the same period of 1916, a decrease of 452,623 tons, or 1.4 per cent. The decrease is insignificant, but the curtailment in production this year is very important, for the reason that there is a largely increased blast furnace capacity available, if it could be operated. At least a dozen entirely new furnaces have been completed, at various dates, and these should have yielded a very considerable increase in production. In addition, a number of furnaces that had been transferred to the abandoned list have been resuscitated. The blast furnace list of THE IRON AGE contained about 390 stacks, active or potentially active, at the beginning of 1916, while now it contains 413, making a net increase of 23, either new stacks or stacks restored to the possibilities. During the first ten months of last year there was an average of 317 furnaces in blast, while this year the number in blast has increased from 311 on Jan. 1 to 355 on Nov. 1; but the larger number of stacks has produced a smaller tonnage of iron.

The average output per furnace has decreased very materially, and that decrease has been due almost entirely to insufficient supply of coke. The particularly distressing feature with respect to coke is that it was not necessary for the beehive ovens to increase their output, in order to provide coke for the greater number of blast furnaces prepared to consume it. If they had merely produced as much coke this year as they did last year the by-product ovens would have taken care of the increased requirements, with something to spare. The statistics of the Connellsville *Courier* indicate that the output of the Connellsville and Lower Connellsville region has been running 17 per cent below that of last year, equivalent to a decrease of 3,600,000 tons in a year, or more than enough to make 3,000,000 tons of pig iron. The decrease is due in chief part to there being less coal mined in the Connellsville district for coking purposes, though some of the decrease is attributable to the transfer of the coking operation from beehive ovens to by-product ovens completed meanwhile. The attendant curtailment of beehive coke production was dictated by necessity rather than choice, in all probability. The steel interests which have put by-product ovens in operation and have fed them with their Connellsville coal would have found a good market for beehive coke if they had been in position to feed their by-product plants with other coal, at a reasonable cost and continue the manufacture of beehive coke.

More than a month ago the Washington authorities issued a priority order upon the railroads, in favor of a full car supply to the Connellsville region, but thus far no improvement has been noticeable in the situation. The general wage advance of Oct. 1 has been followed by another advance, effective Nov. 10, and that is still to be tried out. Wage rates now average three times those of 1894, when the *Courier* estimated the average market price of the entire year's production at $1 a ton. Now we have wages tripled and the price sextupled.

The American Iron and Steel Institute has begun the monthly publication of statistics of steel ingot production. The figures, given in more detail on another page, may be summarized as follows, the production of works which in 1916 produced 88.14 per cent of the total:

	Monthly Output, 1912 Gross tons
First six months	3,150,137
Third quarter	3,011,530
October	3,351,935
Ten months	3,128,735

The apparent gain in production in October is somewhat illusory, as the month had 27 working days, or one and one-third days more than the average of the preceding nine months. This makes an increase of 5.2 per cent in the working time, with an increase of 8 per cent in the tonnage, comparing October with the nine months preceding. Compared with the daily output in the three preceding months, October makes a slightly better showing, with a gain of about 6 per cent. The institute estimated the total ingot output for the current year at 42,600,000 tons, against last year's output of 40,401,917 tons, the estimate for this year being on the assumption that production by the 11.86 per cent not reporting was in the same proportion as in 1916.

The increase in ingot production this year, concurrent with a decrease in pig-iron production, is decidedly interesting. There has evidently been a decrease in the consumption of pig iron by the iron foundries. Last year the ingot production exceeded the total production of coke and anthracite pig iron by about 6 per cent. This year it has been exceeding it by 10.6 per cent. This would indicate for the whole of this year a pig-iron production 1,700,000 tons less than the amount that would be produced to maintain the same ratio of pig-iron production to ingot production as existed last year. This deficiency probably means in part less pig iron consumed in making ingots, with correspondingly greater consumption of scrap, in part a decrease in pig-iron consumption outside the manufacture of ingots and also to some extent a reduction in the amount of pig iron in stock at the beginning of the year.

As late as August of this year, notwithstanding the great demand of our own shipbuilding industry for ship plates and the urgent need of their conservation, Japan received 57 per cent of the month's exports of plates, or 28,591 tons out of a total of 49,801 tons sent out of the country. For the nine months ended Sept. 30, 1917, Japan took 49 per cent of the total export shipments of plates. It is noteworthy, also, that of the total August exports of 74,937 tons of plates and sheets, Japan received 41 per cent, while of the total of these products for the nine months ended Sept. 30,

Japan took 36 per cent. The building up of the Japanese merchant marine in contrast with American lethargy in this paramount matter, even in the face of the wholesale destruction of ocean vessels in the first two years of the war, is one of the chapters in recent history which this country must always contemplate with anything but pride.

Forward Look in Machine Tools

What is to become of our large production of machine tools after war demands have ceased? The question has been asked many times in the past three years and was raised again at the recent convention of the National Machine Tool Builders' Association by President J. B. Doan. The answer seems to have been given by those who spoke at the meeting on prospects for export trade after the war. If half they said on post-war conditions in Russia, France, Belgium, Spain and South America proves right, it is evident that there will be a market for American machine tools in all the industrial countries of the world in the reconstruction period.

Russia's annual imports of machine tools before the war were approximately $5,000,000, of which three-fourths came from Germany. As a matter of self-preservation Russia must become a greater manufacturing nation then ever. The only way in which she can recoup her losses is by using her raw materials and labor in manufacturing. France through the war has developed into a greater industrial nation with plans for further expansion. Belgium has been stripped of machine tools by the Germans. For the rehabilitation of manufacturing plants she must purchase thousands of tools, and a considerable part of this business will logically come to the United States. Spain is rapidly expanding in manufacturing through the exigencies of war; and even South American countries, though principally engaged in agriculture, cattle raising and mining, are bound to become larger users of machine tools.

The point that received emphasis in every one of the five addresses at the New York convention was that the business would not come for the mere asking, but that American machine tools builders must organize and plan their post-war selling campaigns now. A pertinent suggestion made by G. E. Briggs of the National City Bank, New York, who has had extensive experience in South America, was that our machine tools builders in non-competitive lines associate in forming export selling organizations, appoint agents in leading distributing centers of South America and employ their own expert salesmen and service men to travel the continent and demonstrate the superiority of the machines.

The Western Screw & Lock Nut Co., maker of screw machine products and lock nuts, has changed its name to the Drake Lock-Nut Co. Offices will be maintained at the old location, 342 Mills Building, San Francisco.

The Hydraulic Pressed Steel Co., Cleveland, will enlarge its plant by the erection of an addition 80 x 625 ft. The general contract has been placed with the Westinghouse-Church-Kerr Co.

CORRESPONDENCE

Abrogation of Contracts

To the Editor:—We are astounded at any propos tion suggesting the repudiation of contracts. Is it po sible that America proposes to pattern after Germa and consider a contract a scrap of paper to be de troyed at its pleasure?

For a period extending over more than two yea with prices steadily going up, the mills have fulfil their obligations in the face of rising costs. For long period past, all prospective buyers have be warned that they would be expected to take the t nages contracted for. Further, for more than months, the hand writing on the wall has called caution in making purchases, and to buy no more th the business required. Under these circumstances, a one who placed large contracts for material at hi prices did so from purely speculative motives, hop that rising prices would enable them to make a ha some profit, or, in case of a decline, that they co some how sneak out of them. If there is to be any tegrity in business, certainly a contract should be li up to. Many of the mills buying raw material, co for their requirements of raw material as they m sales, and to any of these, a repudiation of contr would mean a direct loss. We cannot see how cance tion of contracts at higher prices will help the situati and it certainly won't help business honor.

There is no doubt in our mind that the mill give preference to orders at high prices, ra than any which the public may be able to place Government prices. Of course, all patriotic conce will give preference to any Government work, reg less of price. We believe that the public consumer, able to get a priority certificate, will be a long time ting his material, unless he is willing to pay a rea able price for it. We are fearful that the Governm prices now ruling will be such as to shut down man the smaller mills, thus curtailing output, when pro tion should be at its maximum. Would it not have b better to have made a price which would have ena the smaller fellows to run their mills on a small pr and then take the excess profit made by the la manufacturer through taxation?

Philadelphia. LEWIS F. SHOEMAKER.

Manganese in Ordnance Steel

To the Editor: The note by Prof. Henry M. H in your issue of Nov. 2 on "Manganese in Ordna Steel," is interesting, as it is a departure from vogue and arguments made in this country gener up to this time.

It is well known on the other side that steel of kind Professor Howe cautions against using will give results that compare with good carbon steel. use of the term "low manganese steel" is new, and yet it expresses exactly the quality of such m The best Continental steel-making practice never manganese the place of carbon at all. Bessemer was never regarded there as equal to metal in w the carbon and iron and other constituents brought to the proper proportions in the well-es lished methods of refining.

The linings for guns and like uses of steel long been known in Europe to require the best ca steel; and if manganese was present at all it wa very small degree and in the condition which its p ence in small amounts in the ore caused. The sam true of iron and steel used there to make motor cylin and all parts that must endure heavy strains shocks, especially when subjected to extreme variat of heat and cold.

So far as the writer has observed, these de have not yet been taken up by makers of ordna and motors in this country, but they will be, no do before long.

New York, Nov. 12, 1917.

WILL DO THEIR BIT

Automobile Manufacturers Co-operating with the War Board

As the result of conferences between the War Industries Board and representatives of the automobile industry of the United States, a committee of automobile manufacturers will make its headquarters in Washington and co-operate with the war board in all matters affecting the relations between the Government and automobile makers. This committee is headed by Hugh Chalmers, chairman of the board of the Chalmers Motor Co., Detroit, and the other two members are John R. Lee of the Ford Motor Co., Detroit, and A. W. Copeland of the Detroit Gear & Machine Co., Detroit, who represents the Motor and Accessory Manufacturers' Association. Mr. Chalmers was appointed by the National Automobile Chamber of Commerce.

The War Industries Board decided to curtail the production of passenger automobiles on the ground that they are non-essential in the prosecution of the war. As reported in a Washington dispatch to THE IRON AGE last week, the automobile manufacturers opposed the cut and suggested that if curtailment of production must be brought about, the industry, itself, be permitted to do the cutting. Production of cars can continue so long as the automobile industry can show itself capable of making all needed munitions at the same time. Unconfirmed reports are that the committee above referred to will have an opportunity as soon as it gets started at work in Washington to divide about $100,000,000 worth of munition contracts among those automobile plants which are equipped to handle such work with a minimum of readjustment of organization and equipment.

It is decided that production of passenger automobiles will be curtailed, possibly from 30 to 50 per cent. Output of passenger automobiles this year to date has been running at the rate of about 1,500,000 per year and production of trucks at the rate of about 200,000 this year, compared with 92,000 in 1916, this gain being due very largely to orders for army purposes. Manufacturers of passenger automobiles, anticipating the decreased demand for their products, which has now become a serious factor, have been making plans for, or are already engaged on other work. The Packard Motor Car Co., the Ford Motor Co., Dodge Bros., the Lincoln Motors Co., the Simplex Automobile Co., the Hall-Scott Motor Co., the Fageol Motor Co., the Pierce-Arrow Motor Car Co., the Locomobile Co. and the Nordyke-Marmon Co. are all engaged on war contracts, and in some instances have already curtailed motor car manufacturing. Dodge Bros. are the only manufacturers who have announced plans for munition making, but under the new plan others will be heard from in this connection in the near future. Dodge Bros. have taken a $30,000,000 contract for gun recoil mechanisms and will erect a plant costing $1,500,000 in Detroit, besides utilizing a part of their present plant and equipment.

New Installations of Heroult Electric Furnaces

Licenses for the installation of the following Heroult electric furnaces have been issued by the U. S. Steel Corporation:

The Bethlehem Steel Co., South Bethlehem, Pa., will install one 3-ton furnace for making steel castings. This company already has a 6-ton furnace making ingots of special steels.

The Illinois Steel Co. will install one 25-ton furnace at its South works, South Chicago, Ill., supplementing the two 25-ton and two 15-ton furnaces, now operating.

The installation of these two furnaces will bring the total, operating or contracted for, in the United States and Canada to 146.

The Standard Steel Products Co., New York, has leased offices at 42 Broadway for local headquarters.

CONTENTS

STEEL FOR AEROPLANES

Use of Air Hardening and Stainless Steels—Other Important Factors

DR. W. H. HATFIELD recently discussed the subject of steel for aeronautical work in a paper before the English Aeronautical Society. An abstract follows, as given by the *Journal* of the Society of Chemical Industry.

Dr. Hatfield emphasized the importance of using high-class material and of employing scientific methods in works practice. Accurate heat treatment based on the thermal phenomena associated with each steel is essential and this necessitates in works practice the use of satisfactory and properly standardized pyrometers. The best types of furnaces, efficiently constructed and worked, are also required if homogeneous results are to be anticipated in the final product.

Though it has often been pointed out that the term factor of safety is misleading, yet its erroneous use continues. A true factor of safety should be the ratio between the stress which may be safely applied indefinitely under the actual working conditions to the stress actually employed. The actual values of this factor employed in modern design have been arrived at largely by the method of trial. Better results might be obtained and fewer mysterious failures result if the various contingencies to be allowed for were carefully examined and the factor placed on a more definite basis.

Elastic Limit and Maximum Stress

Among these contingencies is low elastic limit as compared with maximum stress. The difficulty of measuring the true elastic limit militates against this fundamentally important figure being determined, as frequently as it should be. Our ignorance as regards the properties of steels below the yield point is considerable, while of the properties between the yield and the breaking stress it is still greater. Variation of temperature, too, has a marked influence upon the physical properties of steel and the influence of the ranges of temperature to which the parts have to be submitted in practice should be carefully studied.

Corrosion might be carefully and profitably considered, particularly as regards seaplanes. Other items which require attention are the internal stresses left after forging and probably also after heat treatment, and non-uniformity of material, especially as regards conditions produced by unskillful methods of manufacture and heat treatment. Inclusions of slag, exaggerated sulphide inclusions, defects caused by unsatisfactory treatment in the forge and last but not least hardening cracks are also extremely important.

Parts Subjected to Shock

Parts not subjected to shock should be produced from material having a high elastic limit with just sufficient ductility to insure non-brittleness, whereas for parts subjected to severe shock toughness is the more important feature. The division between these two classes of stresses is not very sharp and in many cases a compromise would appear to have been made between two types of material. All the parts under consideration are of relatively small section and lend themselves to very careful heat treatment.

Material for Pistons

There is such wide divergence of opinion as to the best material for pistons that cast iron, steel and even aluminum alloys are all in use at the present time. The author records having had definite indication that pistonheads have spent a considerable time in service above the critical point, 730 deg. C. Generally speaking, the fluctuations of temperature during a cycle of operations take place too rapidly for such changes materially to affect the temperature of the piston or cylinder walls, except just at the skin of the material. The possibility of attainment of extremely high local temperatures at the skin depends largely on the thermal conductivity and specific heat of the material, high values in these tending to reduce the fluctuation in temperature.

For many steels the yield point is not a definite value. If yield point is to be taken as a guide to the value of true elastic limit and if elastic limit is to be taken as the basis of design, then this quantity must have much more attention than it usually receives.

The use of impact tests of the Izod and Charpy type is not justified in view of the anomalous results obtained in practice. The torsion test is of particular interest to aero engineers since any shaft which transmits power suffers torsion and the natural way of testing the strength of such a shaft or of the material of which it is made should be by torsion.

Importance of Air Hardening Steels

In discussing the properties of a number of typical steels used in aero work the author described air-hardening steels as extremely important and predicted that when they are more completely understood, they will be used to a much greater extent than at present. An air-hardening steel heated to temperatures of 800 to 850 deg. C. and allowed to cool in air will have great hardness, whereas the hardness introduced by the same treatment in an ordinary carbon or even a high tensile steel is in no way comparable. It is the presence of a high percentage of nickel, as well as chromium, that induces the specific property. Such steel on air hardening from 800 to 850 deg. C. gives 100 tons per sq. in. maximum stress and upward, accompanied by an elongation in the neighborhood of 10 per cent. Such results should be extremely valuable to engineers designing aircraft parts.

Stainless steel, a low carbon steel with 11 to 15 per cent of chromium, is air hardening and has the property of successfully resisting the ordinary corrosive action of the weather, the change from wet to dry atmospheric conditions, organic acids, oxidizing influences and sea water. It should, therefore, have a large application to seaplane work. At present it is used for aero valves and would appear to be a possible material for stream-line wires.

A considerable tonnage of sheet steel is employed in aero work, as for manufacturing clips, etc. The steel used for such purposes has usually a low tensile strength, about 28 to 30 tons. A higher class of sheet steel is being used containing nickel, which gives approximately 35 tons tensile strength per sq. in., with a considerably higher yield point than the mild steel. A drawback to this latter steel is that there is some difficulty in working it.

Steel Ingot Production in October

The American Iron and Steel Institute reports as below the production of steel ingots in the United States in October and in the first ten months of the year. The figures are the totals of the outputs of 29 companies which made 88.14 per cent of the steel ingots produced in the previous year, and are in gross tons:

	Total First Six Months.	Third Quarter. July-Sept.	Total First Nine Months.	October.	Total First Ten Months.
Open hearth..	13,681,483	6,599,048	20,280,531	2,475,754	22,756,285
Bessemer.	5,164,139	2,411,108	7,575,247	870,494	8,445,741
Other ...	55,198	24,435	79,633	5,687	85,320
Total..	18,900,820	9,034,591	27,935,411	3,351,935	31,287,346

It will be seen that October output, at 3,351,935 gross tons, was considerably larger than the average of 3,011,530 tons for the preceding three months. It is to be noted, however, that there were 27 working days in October, as against an average of 25.5 working days for the first nine months of the year. The Iron and Steel Institute, on the basis of its figures, estimates the production of ingots in the country for 1917 at 42,600,000 tons.

The Evertite Locknut Corporation, New York, has changed its company name to the Evertite Nut Corporation.

INVESTIGATION OF ACCIDENTS

Important Facts Disclosed by the Bureau of Labor Statistics

WASHINGTON, Nov. 13.—In a report upon accidents and accident prevention in machine building, which has just been completed by the Bureau of Labor Statistics, an innovation in the preparation of statistics of this character is introduced to show the seriousness of accidents as well as their frequency. For this purpose, new data are introduced under the title of "severity rates." The result is a collection of illuminating figures which show not only the number of accidents occurring in plant or industry or per thousand of employees, but also the extent to which the working forces employed have been actually incapacitated by injuries incident to their occupations.

The meaning of the term "severity rates" may be best expressed by an example: Assume that a plant employing 1000 300-day workers during the course of a year had 200 accidents, and that the total time lost by the men injured was 5000 working-days; the accident frequency rate for the year would be 200 per 1000 workers; the "severity" rate would be 5000 days lost per 1000 workers, or, more conveniently expressed, an average of five days per individual worker.

To make such computations, it is necessary, of course, to express fatal and permanent injuries, as well as temporary disabilities, in terms of workdays lost. This is done by valuing a fatal injury (assuming the employees killed of an average age of 30) as equivalent to the loss of 30 years' work time—9000 days. Other injuries—such as loss of hand or foot—are credited with lower time losses, in proportion to their probable effect upon earning capacity—2196 days for a hand, 1845 days for a foot, etc. This method of evaluating permanent injury in terms of time loss, although based upon somewhat rough estimates, is by no means arbitrary.

More Accurate Measure

Severity rates, thus computed, constitute a very much more accurate measure of accident hazard than do the older frequency rates. A striking example may be cited: The machine-building industry, in one year, had an accident frequency rate of 118 per 1000 300-day workers. This was, as it happened, actually higher than the accident frequency in a large steel plant in one year, the rate there being 114.5 cases per 1000 workers. But even a casual acquaintance with the two industries would indicate that the steel plant represented the more hazardous employment, inasmuch as its accidents are, on the whole, of a more serious character than those occurring in machine building. This was evident when severity rates were computed according to the method described, the steel plant having a severity rate of 21.2 days lost per full-time or 300-day worker, as against only 5.6 days lost per worker in machine building. In this case the severity rate is clearly more valuable than the frequency rate in indicating the relative hazards of the two industries.

The investigation here summarized was based upon statistics covering 1912, that year being chosen because of the completeness of the figures obtainable. As it was obviously impossible to cover all the plants engaged in the industry, the inquiry was limited to 194 typical establishments which worked 347,109,000 man hours, which is equivalent to 115,703 full-time or 300-day workers.

Accident Rates, by Departments

Classifying the combined plants by departmental divisions, boiler shops and yard labor show by far the greatest hazards. Boiler shops have a frequency rate of 224.1 per 1000 workers and a severity rate fo 26.7 days lost per worker, while yard labor has a frequency rate of 221.1 and a severity rate of no less than 29 days lost. These rates are, roughly, as high as those in the iron and steel industry, which is recognized as inherently a much more hazardous industry than machine building. The high rates of the boiler shops are, primarily, the result of insecure trestles and scaffolding. For the excessive rates in the yard department, responsibility rests upon the general neglect of safety precautions in the transportation work of many plants.

Effect of Safety Systems

A striking method of showing the effect of a good safety system in accident prevention is to compare the accident rates in plants having, with those in plants not having, well organized systems. This was done for three important groups of plants. In every case the plants not having a good safety organization show accident frequency rates three or four times as high as those having a well-developed system.

Important Causes of Accident

The analysis of accident causes, together with the determination of occupational rates, is at present the most important practical subject to be considered in accident studies. A careful study of accident causes was made in selected groups of machine-building plants.

For the industry as a whole "falling objects" stands out as the most frequent cause of accidents, the frequency rate for five machine-building plants from 1907 to 1912 being 14.44 cases per 1000 300-day workers, and for four machine-building plants, 1910 to 1913, 14.35 cases per 1000 300-day workers. As measured by severity, "cranes and hoists" assume first place, the severity rate being 2.26 days lost per 300-day worker in the group of five plants, 1907 to 1912, and 1.22 days lost per 300-day worker in the group of four plants, 1910 to 1913. In foundries "hot metal" appears as the accident cause with most serious effects, the severity rate being 2.82 days lost per worker out of a total of 7.41 days lost for all foundry causes.

Methods of Accident Prevention

Experience has everywhere shown that the most effective work for the prevention of accidents must come from a proper safety organization within the plant itself. Such an organization involves some form of a safety committee system, with representatives of both employer and employees working together to develop the best safety methods, not only in the field of mechanical safeguards, but also in the education of the employees in the observance of proper precautions and the maintenance of the safety spirit. It is important to note, in this connection, that the existence of compensation laws in most of the States now furnishes an economic incentive for accident reduction, which was so often absent under the old liability system.

The plant safety organization, however, does not itself do away with the need of mechanical safeguards. It is rather an assurance that the proper safeguards will be adopted and will be properly used. For practically all of the dangers attending the use of the machinery and processes in machine building, excellent safeguards have been devised and are in use in certain plants.

W. L. C.

Large Decrease in Steel Corporation Orders

Unfilled orders on the books of the United States Steel Corporation on Oct. 31 were 9,009,675 tons, a decrease of 823,802 tons from the report for September when the total orders on Sept. 30 were 9,833,477 tons. This is the sixth successive monthly decline and is the largest of any. The following table gives the unfilled tonnage of the United States Steel Corporation at the close of each month since January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June	11,383,287	9,640,458	4,678,196	4,032,857
July	10,844,164	9,593,592	4,928,540	4,158,589
August	10,407,049	9,660,357	4,908,445	4,213,331
September	9,833,477	9,522,584	5,317,618	2,787,667
October	9,009,675	10,015,260	6,165,452	3,461,097
November	.....	11,058,542	7,189,489	3,324,592
December	.....	11,547,286	7,806,220	3,836,642

Iron and Steel Markets

JOBBERS' PRICES FIXED

Narrowing Steel Uses to War Needs

Plates to Go to Japan—Pig-Iron Activity Continues, Particularly for Steel Making Irons

The adjustment of the steel trade to the new regime in prices and to an increasing diversion of mill products from accustomed channels of consumption is proceeding with less friction than had been expected. The difficulties of the mills growing out of the lack of co-ordination at Washington are still painfully apparent, and in the past week the industry in the Central West, particularly at Youngstown, has lost pig-iron and steel output from coal and coke shortage. Car troubles have also increased, and the outlook for winter operations, as to cars, fuel and labor, is not encouraging.

Working continuously, the manufacturers' committee appointed to bring all prices in line with those already fixed, has brought out a new list, including forging steel, bar iron, boiler tubes, nuts and bolts, boat spikes, electric and automobile sheets, wire rope and pipe skelp, and further announcements are to be made covering screws, railroad spikes and track supplies and a variety of collateral products. Sheet and tin-plate extras are about ready, and there is yet to come a revision of crucible-steel products.

An important feature of the week's new prices is the adoption of a warehouse or jobbing spread of 1c. per pound on sales of plates, shapes, bars, and blue annealed sheets, and 1¼c. per pound on black and galvanized sheets and cold-rolled steel. Though larger than the normal jobber's profit, these amounts are considered fair, taking account of the reduced amount of mill product that will be handled by jobbers under the new conditions. There is no expectation of readjustment of jobbers' contracts with mills, based on higher prices than those now made, the steel companies having for over two years refused any guarantees against declines.

In a few secondary products, as nuts and bolts, the new prices will mean in some cases a revision of contracts. There has been more or less friction, moreover, over the pleas made by various manufacturing consumers of rolling-mill products for a revision of contract prices. But as long as demand exceeds supply no such readjustments are in sight.

As the Government program of steel requirements develops, the steel-consuming trade in various lines is feeling the first cleavage between essential and non-essential industries. As priority rulings multiply, the disturbance from steel scarcity in certain minor lines increases, and it becomes clearer that the list of affected businesses will grow.

Little finished steel is being sold for general commercial needs, most mills being sold for three to six months ahead. But very considerable shipments are still being made on contracts at lower prices than those lately fixed.

The Government's requirements are now counted on to be 100 per cent of ship plate output, after due allowance of plates for war and food industries and railroad upkeep. Many plate users must resort to universal plates and a larger use of rivets.

The total of cars bought for use abroad has now reached 35,000. Besides the 30,000 for Russia, closed late last week, are 4975 for our expeditionary force in France. Italy wants 3000 to 5000 cars.

Japan is negotiating for 15,000 to 30,000 tons of American standard section rails.

Government work continues to monopolize the fabricating steel industry. The business booked in October appreciably exceeded that of September.

Japan is to have an early release for export of the large shipments of plates lately made from mills to Pacific coast warehouses. Orders for about 70,000 tons of plates for the first 25 vessels of the American International Shipbuilding Corporation have been given out at Washington. The Government has also ordered in eastern Pennsylvania 15,000 tons of plates for early shipment to Italy.

Activity in pig iron keeps up and a fair sized tonnage has gone on the books for delivery in the first half of 1918, all at the Government prices and differentials. Philadelphia again shows the largest transaction in basic iron—one steel company buying 45,000 tons for the first quarter of 1918. The Steel Corporation is in the market for 10,000 tons of basic iron for its Pencoyd, Pa., works and this will be the first purchase in years for this plant. In Ohio 6000 tons of basic is sought for shipment to Maryland. In Chicago the demand for basic and malleable pig irons is the feature and there is good inquiry also for standard Bessemer.

Pittsburgh

PITTSBURGH, PA., Nov. 13 (*By Wire*)

The one important thing that has been accomplished by the Government naming of prices on raw materials, such as ore, coke and coal, scrap iron and finished steel, is that the practice of exacting heavy premiums in prices for prompt delivery has been entirely eliminated. This had become an abuse in the trade and there is general relief over the fact that it has been wiped out. The new buying of pig iron, semi-finished and finished steel products since the Government prices came out by consumers other than the Government has been relatively light. Probably 75 per cent or more of the new business has been on direct or indirect Government

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 14, 1917.	Nov. 7, 1917.	Oct. 17, 1917.	Nov. 15, 1916.
No. 2 X, Philadelphia	$34.25	$34.25	$34.25	$25.00
No. 2, Valley furnace	33.00	33.00	33.00	25.00
No. 2 Southern, Cin'ti	35.90	35.90	35.90	22.90
No. 2, Birmingham, Ala.	33.00	33.00	33.00	20.00
No. 2, furnace, Chicago**	33.00	33.00	33.00	26.00
No. 2, del'd, eastern Pa.	33.75	33.75	33.75	26.00
Basic, Valley furnace	33.00	33.00	33.00	25.00
Bessemer, Pittsburgh	37.25	37.25	37.25	29.95
Malleable Bess., Ch'go**	33.50	33.50	....	26.00
Gray forge, Pittsburgh	32.75	32.75	32.75	25.95
L. S. charcoal, Chicago	37.50	37.50	....	25.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$38.00
O.-h. rails, heavy, at mill	....	....	....	40.00
Bess. billets, Pittsburgh	*$47.50	*$47.50	*$47.50	52.50
O.-h. billets, Pittsburgh	*47.50	*47.50	*47.50	52.50
O.-h. sheet bars, P'gh	*51.00	*51.00	*51.00	52.50
Forging billets, base, Pgh.	*60.00	....	....	76.50
O.-h. billets, Phila.	....	....	....	55.00
Wire rods, Pittsburgh	57.00	57.00	*57.00	65.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia	*3.685	4.685	4.25	2.659
Iron bars, Pittsburgh	*3.50	....	....	2.85
Iron bars, Chicago	4.50	4.50	4.50	2.65
Steel bars, Pittsburgh	2.90	2.90	†*2.90	2.75
Steel bars, New York	3.095	3.095	...	2.919
Tank plates, Pittsburgh	†*3.25	†*3.25	†*3.25	4.25
Tank plates, New York	...	...	...	4.419
Beams, etc., Pittsburgh	3.00	3.00	†*3.00	2.80
Beams, etc., New York	3.195	3.195	†*3.195	2.969
Skelp, grooved steel, P'gh	*2.90	*2.90	*2.90	2.70
Skelp, sheared steel, P'gh	*3.25	*3.25	*3.25	2.80
Steel hoops, Pittsburgh	3.50	...	...	3.10

*Agreed prices. †As yet only a few sales made.
**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 14, 1917. Cents.	Nov. 7, 1917. Cents.	Oct. 17, 1917. Cents.	Nov. 15, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	...	3.65
Sheets, galv., No. 28, P'gh	6.25	6.25	...	5.25
Wire nails, Pittsburgh	3.50	...	...	2.85
Cut nails, Pittsburgh	...	...	...	2.80
Fence wire, base, P'gh	*3.25	...	...	2.80
Barb wire, galv., P'gh	*4.35	...	...	3.70
Old Materials, Per Gross Ton:				
Iron rails, Chicago	$35.00	$35.00	$36.00	$25.00
Iron rails, Philadelphia	38.00	38.00	38.00	23.00
Carwheels, Chicago	27.75	27.00	26.00	16.50
Carwheels, Philadelphia	29.00	29.00	29.00	18.00
Heavy steel scrap, P'gh	29.00	30.00	27.00	21.00
Heavy steel scrap, Phila.	26.00	25.00	25.00	19.50
Heavy steel scrap, Ch'go	28.00	28.00	25.00	20.50
No. 1 cast, Pittsburgh	26.00	27.00	27.00	17.00
No. 1 cast, Philadelphia	30.00	28.00	28.00	18.00
No. 1 cast, Ch'go (net ton)	22.50	21.00	20.00	15.50
No. 1 RR. wrot, Phila.	35.00	35.00	35.00	23.50
No. 1 RR. wrot, Ch'go (net)	31.00	31.00	29.50	21.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	†*$6.00	$7.50
Furnace coke, future	6.00	6.00	†*6.00	3.75
Foundry coke, prompt	7.00	6.00	...	7.00
Foundry coke, future	7.00	6.00	...	5.00
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	23.50	23.50	23.50	32.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	32.50
Spelter, St. Louis	7.75	7.62½	8.00	11.25
Spelter, New York	8.00	7.87½	8.25	11.50
Lead, St. Louis	6.37½	6.12½	6.87½	6.90
Lead, New York	6.50	6.25	7.00	7.00
Tin, New York	73.00	68.00	61.50	44.12½
Antimony (Asiatic), N. Y.	13.75	14.00	15.00	13.00
Tin plate, 100-lb. box, P'gh.	$7.75	$7.75	....	$6.00

order. This has priority in rolling and shipment and orders for ordinary customers are pushed aside until the Government business has been filled. None of the mills has any material to speak of for delivery this year, so that general customers have not participated very largely in the lower prices named by the Government. On pig iron, billets and bars and finished steel, contracts were in force when the Government prices came out that have not been completed and will not be for some months. Many of these were at much higher prices than the Government named in the different raw and finished steel products. The most serious obstacle that confronts the steel trade now is the demoralized railroad situation that will no doubt get worse as soon as real winter weather starts. The movement of traffic is abnormally slow and the strict regulations that govern shipments make it impossible to move freight with any degree of satisfaction. The railroads are simply up against it, not having the motive power, cars or labor to move the enormous traffic that is being offered. It is the consensus of opinion that the Government should quickly take some action to relieve and improve the present railroad situation, which is by far the worst ever known. A shortage of coal and coke in the Pittsburgh and Youngstown districts is seriously restricting output of pig iron and finished steel. Some seven or eight blast furnaces in Youngstown are banked for lack of coke and others will have to bank unless the supply of coke improves. The steel business is being carried on to-day under the most trying conditions it has ever known. Shortage of labor, cars, coal and coke is contributing to make the situation as regards output and shipments about as bad as it could possibly be. No important price announcement came out during the week but the new discounts on steel and iron boiler tubes are looked for at any time.

Pig Iron.—There is a veritable famine in the local market in the supply of Bessemer and basic pig iron and where iron is to come from to supply the needs of local consumers over the winter months is a good deal of a problem. It is suggested that both Bessemer and basic iron will have to be secured at other iron manufacturing centers, aside from Pittsburgh and the valleys, to meet the demand. Local steel companies are scouring the market everywhere trying to find Bessemer and basic iron, but without success. The N. & G. Taylor Co. wants 5000 tons of basic for its open-hearth steel plant at Cumberland, Md., the National Tube Co., 5000 tons of basic, the Jones & Laughlin Steel Co. has been a heavy buyer of Bessemer and basic and is in the market for more and other smaller steel companies are actively seeking iron but are not finding it. If it were not for the maximum Government prices that now control pig iron, there would be a runaway market that would carry prices to an unheard of level. The Pennsylvania railroad has an inquiry out for 2500 tons of low silicon car wheel iron, 7600 tons of high silicon foundry iron and 1750 tons of high manganese iron. This inquiry is likely to be closed within a few days. The Youngstown Sheet & Tube Co. has four or five furnaces banked for lack of coal to operate its by-product coke ovens. The Carnegie Steel Co. has three or four furnaces banked in the Youngstown district and other stacks there will have to be banked shortly unless coke supply soon gets larger. The Republic Iron & Steel Co. and Brier Hill Steel Co. are running short of iron and have inquiries in the market for Bessemer and basic. A local interest has bought 7000 to 8000 tons of malleable Bessemer iron for making car wheels at the fixed price of $33.50 valley furnace. Fairly heavy sales of No. 2 foundry iron are being made right along at the regular price of $33 valley furnace.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Ferroalloys.—The manufacturers of Bessemer ferrosilicon and silvery iron have adopted and are now quoting the scale of prices adopted for these two products by the general committee of the American

Iron and Steel Institute and the War Industries Board, and later approved by the President. At present there are only two or three sellers of Bessemer ferrosilicon and silvery iron. The Globe Iron Co.'s blast furnace at Jackson, Ohio, is idle for relining and repairs and is out of the market. The Star Furnace Co. and the Jackson Iron & Steel Co., both at Jackson, Ohio, are sold up for some time ahead, the Ashland Iron & Mining Co., Ashland, Ky., has quit making ferroalloys, and the only really active seller for early delivery is the Bessie Furnace Co., at New Straightville, Ohio. New inquiry for ferromanganese is fairly active, and prices on 80 per cent domestic range from $250 to $260 per gross ton, delivered. We quote 18 to 22 per cent spiegeleisen at $60 to $65, and 50 per cent ferrosilicon for prompt shipment at $150 to $160 per ton. On contracts prices range from $140 and higher, depending on the quantity. Some large consumers of 50 per cent ferrosilicon have covered their needs over all of next year.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60, 13 per cent $64.90, 14 per cent $68.20, 15 per cent $71.50, and 16 per cent $75. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50, 11 per cent $53, and 12 per cent $56. These new prices on Bessemer ferrosilicon show reductions over former prices, ranging from $35 to over $60 per ton. On silvery iron the new prices show reductions over former prices of $35 to $40 per ton. All the above prices are f.o.b. makers furnace, Jackson or New Straightville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Billets and Sheet Bars.—There is some inquiry for billets and sheet bars, but so far none of the steel mills seems to have any steel to spare for prompt delivery at the Government price of $47.50 for billets and $51 for sheet bars. Dealers say they are having inquiries for billets and sheet bars for prompt delivery and intending buyers are willing to pay a commission to dealers if they can obtain steel for them at Government prices. The steel mills are covered by contracts made some time ago for billets and sheet bars and are making good deliveries. It is stated that some large tin plate mills have covered their needs of sheet bars over first half of 1918 at the regular price of $51, Pittsburgh or Youngstown mill. We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50 and sheet bars at $51, maker's mills, Pittsburgh or Youngstown.

Structural Material.—The amount of new work outside of Government needs is very small. The McClintic-Marshall Co. has taken about 400 tons for a new steel building for the Donner Steel Co. at Buffalo. Nearly all new jobs being placed are either direct or indirect Government, details of which are not given out. The Fort Pitt Bridge Works have taken 680 tons for a new machine shop for the Wellman-Seaver-Morgan Co., Akron, Ohio. We quote beams and channels up to 15 in. at 3c. at mill.

Plates.—In addition to the contract for 30,000 cars for Russia, noted last week, the Italian Government is in the market for 3000 to 9000 high side four-wheel steel gondola cars, and this order may possibly be given out this week. We are advised that more plates are available right along for fairly prompt shipment at the fixed price of 3.25c., but the larger mills are sold up for months ahead on plates for Government and other works, mostly the former, and are paying little attention to the 3.25c. price. We quote ¼-in. and heavier sheared plates at 3.25c. at mill, Pittsburgh.

Steel Rails.—As yet no announcement has come out of any changes in prices on standard sections or light rails, and very little new business is being placed. Nominal prices on standard section and light rails are given on page 1217.

Sheets.—All the sheet mills adopted at once the new Government prices that came out on Monday, Nov. 5. Last week the district sales managers for the American Sheet & Tin Plate Co. were here for a three-day session, during which conditions in the sheet and tin plate trade and general business matters were fully discussed. The American Sheet & Tin Plate Co. has apportioned to its district sales managers its output of sheets, and very shortly the district sales managers will take contracts from manufacturers only for sheets at the Government prices for delivery over first half of 1918, with the exception that contracts for galvanized sheets will be for first quarter of next year only. The policy of this company as regards sales to jobbers has not yet been determined, but will likely be announced within a short time. Some sheet mills report a larger demand, and some fair sized orders for different grades of sheets have been placed at the new Government prices for delivery this year. It is probable also that contracts have been for delivery in first quarter and first half of next year to manufacturing consumers. It is not believed that the Government price on sheets, as now in effect, will be changed on Jan. 1, as they are conceded by manufacturers and consumers alike to be eminently fair, with the exception that some makers of galvanized sheets who are not self-contained feel that the price of 6.25c. on No. 28 gage is too low. We quote blue annealed sheets, No. 10 gage, 4.25c.; No. 28 Bessemer black, 5c.; No. 29 galvanized, 6.25c.; No. 28 tin mill black plate, 5c., in carloads, f.o.b. Pittsburgh, rolled from Bessemer or open-hearth stock. Prices on sheets are given in detail on page 1217.

Tin Plate.—The American Sheet & Tin Plate Co. has apportioned to its district sales managers in various cities its output of tin plate for first half of 1918, and within a short time will accept contracts from its customers for delivery over the first half of 1918 at the Government price of $7.75 per base box, Bessemer or open-hearth stock. Some tin plate mills have not yet started to sell tin plate for first half of 1918 delivery, as they have not yet been advised how much steel will be given to be used in the manufacture of tin plate, and they are unable to estimate what their output will be for the first half of next year. It is understood that contracts for sheet bars from tin mills that buy steel in the open market have been practically made on the basis of $51, and should this price be raised or lowered, the tin mills are to abide by any change in price of tin bars that may be made. The output of tin plate in the first half of next year at least will be relatively small, as manufacturers will concentrate their entire resources with a view of producing a maximum output of tin plate for the packing of perishable foods. In order to more fully conserve the output of tin plate for packing perishable foods, the food administration board has issued an order forbidding the canning of dry beans and peas without a special Government permit. The Government holds that these two products can be marketed to a large measure without being canned. The Government has also made some stringent license rules in regard to exports on tin plate and has ruled that tin plate leaving this country must be used only to contribute to the military or vital needs of the nations at war against Germany. Preference will be given in all cases where it is proven that the tin plate is to be used to contribute to the production or transportation of foodstuffs for the United States and her Allies. We quote coke plate at $7.75 per base box, f.o.b. Pittsburgh, for Bessemer or open-hearth stock. Effective Wednesday, Nov. 7, some slight reduction in prices on certain sizes of terne plate were made, these changes in prices to apply only on new orders booked from Nov. 7 or after. The new prices now in effect on terne plate are given in detail on page 1217.

Boiler Tubes.—Makers of iron and steel boiler tubes formulated new discounts which were sent to the general committee on iron and steel products of the American Iron and Steel Institute and they were then forwarded to Washington for Government approval. The prices as agreed upon will be found elsewhere in this issue. Recently the sub-committee on tubular products of the American Iron and Steel Institute placed some large orders with the mills for iron and steel tubes for use in the boilers being built for the Emergency Fleet Corporation's ships.

Railroad Spikes and Track Bolts.—As yet, manufacturers of track bolts have made no change in their price quoted for some time and railroads are naming

6.50c. to 7c. in carload lots, while to the small trade, 8c. at mill is being quoted. Prices on standard size railroad spikes are slightly lower, but demand for track bolts, also railroad spikes, is quiet. Prices on track bolts and railroad spikes are given in detail on page 1217.

Nuts and Bolts.—Nearly all the new business being placed in nuts and bolts is for Government work, the commercial demand for some time being very light. Discounts just announced are given on page 1217.

Rivets.—Most of the new business being placed in rivets is on direct or indirect Government orders, the new demand from domestic consumers having been dull for some time.

Wire Products.—All the makers of wire products have agreed on standard prices, based on $3.25 on plain wire per 100 lb., f.o.b., Pittsburgh, announced by the Government on Monday, Nov. 5. Some mills believe that the price of $3.50 on wire nails is unduly low. Taking basic iron at $33 and Bessemer at $36.30, Pittsburgh, it is figured out that the rods alone will cost close to $60 per ton, and in addition there is an extra cost of drawing into wire, cutting the nails, furnishing the kegs, which cost 15c. to 18c. each, heading and other incidentals. Some manufacturers believe the price of nails should have been fixed at $4 to allow a fair margin of profit. However, all the manufacturers have adopted the $3.50 price, but would much prefer to sell plain wire at $3.25, as there is more profit in it than in nails at $3.50 per keg. There is also more profit on some other grades of wire than in making nails at $3.50 and it is probable some manufacturers may materially decrease their output of wire nails. The new demand for wire and wire nails is reported better and the export demand, which comes from practically all foreign countries, is reported heavy. Sales of wire nails have been made lately for export that realized $5 and even $5 10, base, per keg, f.o.b., New York. Existing contracts on wire and wire nails are not to be disturbed by the new prices. The prices now in effect on wire and wire nails are given in detail on page 1217.

Wire Rods.—Local makers report quite a heavy domestic and export demand, but are pretty well sold up for the remainder of this year and have very few rods to spare. Small manufacturers of wire and wire nails, who buy rods in the open market, will hardly be able to realize a profit with rods at $51 and costs of labor and incidentals at present high rates. We note a sale of 300 tons of soft open hearth rods at $57, Pittsburgh, for this year's delivery. We now quote No. 5 common basic or Bessemer rods at $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65, all these prices being f.o.b. Pittsburgh. Prices on rods are given in detail on page 1217.

Hoops and Bands.—Manufacturers are now quoting the steel bar price on bands, which is 2.90c. and a differential of 60c. in favor of steel hoops, making the price of the latter 3.50c. None of the mills has very much tonnage in either hoops or bands for this year, having contracts at higher prices which will take some months to clean up. We quote steel bands at 2.90c., extras as per the steel bar card and steel hoops 3.50c. f.o.b. mills, Pittsburgh.

Iron and Steel Bars.—Sales of both iron and steel bars are confined mostly to small lots for shipment prior to Jan. 1. Some large consumers covered several months ago for first quarter and in some cases for first half of 1918 at higher prices than are in effect on steel bars, and specifications against these contracts are fair. Iron bar makers have not yet adjusted their prices to put them more in line with the 2.90c. price on steel bars, but may do so in a short time. Large quantities of steel bars are being used in recent Government orders for cars and also for other Government work and will take absolute priority in shipments. The price on steel bars is good only until Jan. 1, but it is not believed it will be revised at that date. We quote steel bars at 2.90c., refined iron bars at 4c. to 4.25c. in carloads, f.o.b. mills, Pittsburgh.

Shafting.—It is understood that some fairly large orders for shafting have been placed in the last week at the new Government price of 17 per cent off list, which makes the basing price 4.15c. at mill. Other contracts placed some time ago on which the price was left open have also been adjusted to the new basis. The demand for shafting from the automobile trade is dull, but from screw stock machine people is heavy. The Government is also a large buyer of shafting, both on direct and indirect orders. We quote cold rolled shafting at 17 per cent off list, f.o.b., Pittsburgh.

Cold Rolled Strip Steel.—Manufacturers of cold rolled strip steel continue 7c per pound in carloads and larger lots, f.o.b. Pittsburgh, and on contracts for delivery within 60 to 90 days. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 pounds or more.

Wrought Pipe.—All makers of steel pipe have adopted new cards based on the Government discount, which puts ¾ in. to 3 in. black pipe at 51 per cent, galvanized at 37½ per cent, an extra discount of 1 point, 5 and 2½ per cent being made to the large jobbing trade. Manufacturers of iron pipe have sent out new cards under date of Nov. 7, reaffirming former discounts in effect for some months. New discounts have also been adopted on line pipe. Oil country goods have also been revised in prices to a basis somewhat higher than quoted for some time by the National Tube Co. and lower than quoted by other mills. The Government has been a fairly heavy buyer of steel pipe recently, its orders having been divided among the mills based on capacity. One maker has taken an order for 14,000 tons of 3 in. steel pipe to be used for trench mortars. This will be a very high grade pipe, made from the best quality of skelp. Present discounts on black and galvanized iron and steel pipe being quoted by the mills are given on page 1217.

Coke.—The announcement by the Government last week of the price of $7 on 72 hr. foundry coke and $7.30 per net ton of 2000 lb. on crushed coke has done much to clear up the unsatisfactory condition that has existed in the coke trade since the Government made a price of $6 on furnace coke on Sept. 24 last. This price of $6 on furnace coke was also reaffirmed by the Fuel Administration Board and sets at rest any doubt as to whether this price would remain in force and also the absurd report that was printed that the $6 furnace coke was not legal. Since the new prices went into effect, the underhanded methods employed by some small coke operators to get higher than $6 for furnace and foundry coke have largely disappeared and it is hoped will very soon be only a memory. The resolution by the Fuel Administration approved the above named maximum prices and also provides that brokers are not to get a commission. The unexpected announcement of the Frick Coke Co. of a heavy advance in wages for coke mine and coke oven labor was a very great surprise to the trade. The company made a 10 per cent advance on Oct. 1 and in a little over a month has made another still heavier advance. We are advised that some contracts for furnace coke for first half of next year have been made at $6 per net ton at oven, but prior to Sept. 24 contracts were made between several leading producers of high grade furnace coke and blast furnace operators at $9 per net ton at oven, effective from Jan. 1 to June 30, 1918. The coke producers who made these contracts are shipping coke to the same consumers over the remainder of this year at $6 per ton at oven. We now quote furnace coke at $6, 72 hr. foundry coke at $7 and crushed coke over 1 in. size $7.30, all in tons of 2000 pounds at oven. The *Connellsville Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending Nov. 3 as 332,423 tons, an increase over the previous week of 26,443 tons.

Old Material.—The new Government maximum prices of $30 per gross ton, delivered at consuming points on heavy melting steel, $20 on borings and turnings, and $35 on No. 1 railroad wrought scrap are not being maintained at any of the consuming points outside of Pittsburgh, and in fact in this district are from $1 to $2 per ton lower than named by the Government. Just now prices for scrap are higher in the Pittsburgh district than at any other consuming point.

None of the local dealers will sell material for delivery in Cleveland, Chicago, Buffalo, Philadelphia, or other leading consuming points, and pay the freight to these points, preferring to do what business they can in the Pittsburgh district where they can realize higher prices. Just now heavy melting steel is about $29, borings and turnings $18, No. 1 railroad wrought scrap $33 to $34, delivered in the Pittsburgh district. Prices at other consuming points on these materials are considerably lower. It is almost impossible to-day for dealers to do any scrap business owing to the rigid railroad restrictions. The railroads still demand permits from dealers and consumers, and will not furnish any open cars unless the party to whom the scrap is consigned will furnish the number of the war order for which the material is intended. It is not likely there will be much scrap business done in this district until after the first of the year, as consumers seem to be pretty well covered. Dealers are now quoting for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$29.00 to $30.00
No. 1 foundry cast	25.00 to 26.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	30.00 to 31.00
Hydraulic compressed sheet scrap	21.00 to 22.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	20.00 to 21.00
Bundled sheet stamping scrap	18.00 to 19.00
No. 1 railroad malleable stock	22.00 to 23.00
Railroad grate bars	15.00 to 16.00
Low phosphorus melting stock	37.00 to 38.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
Locomotive axles, steel	47.00 to 48.00
No. 1 busheling scrap	21.00 to 22.00
Machine-shop turnings	18.00 to 20.00
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	32.00 to 33.00
*Sheet bar crop ends	32.00 to 33.00
Cast-iron borings	18.00 to 20.00
No. 1 railroad wrought scrap	33.00 to 35.00
Heavy steel axle turnings	21.00 to 22.00
Heavy breakable cast scrap	21.00 to 22.00

*Shipping point.

The Stalnaker Steel Co., dealers in iron and steel scrap of all kinds, has located its offices in rooms 1124-1126 Farmers' Bank Bldg., Pittsburgh, these being the rooms formerly occupied by the Ohio Iron & Metal Co., which has discontinued its Pittsburgh offices for the present. The Stalnaker Steel Co. has been organized with a capital of $250,000, of which $160,000 has been paid in. The officers are H. D. Stalnaker, president and treasurer; H. G. Stalnaker, vice-president, and F. S. Easterly, secretary. Mr. Easterly was formerly assistant purchasing agent of the Westinghouse Electric & Mfg. Co. The Stalnaker Steel Co. also maintains offices in the Citizens' Building, Cleveland.

Chicago

CHICAGO, Nov. 12.

In summing up his view of the situation, a prominent official of an independent steel company remarked that the industry is getting down to a sane and decent way of doing business, and his words carried with them satisfaction and relief. Another characterized the manner in which the mills had fallen in line with the spirit of the times as wonderful, at the same time deploring that there were those who would abrogate contracts. If, at a later day, prices should be revised upward, he asked, how would these same consumers feel about the cancellation of their contracts which called for material at the lower levels? The view of not a few consumers that their contract prices are subject to revision has caused worry and considerable friction. Meanwhile, specifications are good, and agreed prices are working in all directions where new orders can be filled. In limited quantity, plates are selling at 3.25c., and structural shapes at 3c. High carbon bars show more or less irregularity, sales having been made all the way from 2.90c. to 4c., Chicago. Bar iron is at sea. There is plenty of inquiry for all kinds of steel products, and the end of the year will bring a large volume of buying. It is reported that independent wire mills have announced their intention of dropping their quotations from the $4 base for nails to $3.50, the quotation of the leading interest. The Government named $3.25 for plain fence wire, not mentioning nails. Shell steel is being actively placed, and bars for gun forgings are sought by the Government. The sheet mills are selling at the agreed prices, and the largest local producer is taking business so fast that it expects to be filled up for the first quarter by the end of this month. While selling, it is making no contracts. A reduction in bolt and nut prices is confidently looked for. Pig iron is active for 1918 delivery at agreed prices. The makers of cast-iron pipe have advanced their quotations $5 per ton. Old material is quiet.

Pig Iron.—Buying for the first half of 1918 is active in all grades of iron, the demand for malleable and basic being especially notable. There is considerable inquiry for standard Bessemer, which is quoted at $36.30, furnace. It goes without saying that all the prices quoted are in accordance with the base of $33, furnace, for No. 2 foundry. For the silvery grades there is fair inquiry for both this year and 1918, with but very little to be had for delivery this year. The principal distributor of Northern iron reports that production is less retarded than it was a few weeks ago, although the coke supply is not what it should be because of inequalities in the coal that is being delivered at the ovens. Among the inquiries is one for 1000 tons from the Chain Belt Co., Milwaukee. Indicative of the extent to which Southern iron is being sold is the fact that the agent of one producer in the past week has placed between 5000 and 6000 tons, all for 1918 delivery. The company in question is offering, for 1918, 1.75 to 2.25 per cent silicon iron at $33, f.o.b. cars, furnace; 2.25 to 2.75 silicon at $33.50; 2.75 to 3.25 silicon at $34.50; silicon, 3.25 and over silicon at agreed prices for high silicon. One brand of the company's production, with manganese guaranteed at 0.75 and production, with manganese guaranteed at 0.75 and over, is offered at an advance of 50c. per ton, and 1 per cent and over at an advance of $1. The company states that it has nothing to offer for delivery in the rest of this year. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, Nos. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable Bessemer	33.50
Basic	33.00
Low-phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Ferroalloys.—The purchase of 400 tons of 80 per cent ferromanganese at $250, with other sales, establishes the market at that level, for delivery this year or in the early part of next. Some 10 to 12 per cent electrolytic ferrosilicon is being offered at about $85 per gross ton, f.o.b. cars, Tonawanda, N. Y. For this product, made in the electric furnace, the claim is made that its phosphorus and sulphur content is less than half that of ordinary Bessemer ferrosilicon. Standard 50 per cent ferrosilicon is offered over the first half of 1918, with a few carloads for November and December, at $150 per ton for 1918 and $163 for this year. Freight is allowed to points east of the Mississippi River.

Plates.—Except for Government purposes, the leading interest is taking no business and the leading independent none, except where it can work in an occasional small tonnage. Eastern producers, however, are taking some plate business at the official price of 3.25c. Flanged plates, taking the usual extras, are also being sold on the basis of the Government price. The Government is steadily increasing the volume of plates it will require the mills to furnish, many orders coming both directly and indirectly from the Emergency Fleet Corporation. The jobbers have not changed their quota-

tion for plates out of stock, but a lower price is looked for.

For material out of warehouse, the quotation is 7c.

Structural Material.—Shapes in a small way are fairly active, the prices being based on the Government base of 3c. As in plates, Government agencies have been active buyers, the usual allotments of shapes being about one-third that of plates. The Western Pacific has placed 1500 cars, and it is reported that about 4900 cars of various types have been distributed among the makers by the Government for its railway in France. Three structural lettings are announced, as follows:

Two 130 ft. and one 140 ft. truss spans for Morrison County, Minn., 159 tons. To International Bridge Co., Evansville, Ind.

Sioux City Terminal Railway Co., deck plate girder bridge across Floyd River at Sioux City, Iowa, 109 tons. To Franklin Bros. Bridge & Construction Co., Minneapolis, Minn.

Holt Mfg. Co., buildings at Peoria, Ill., 600 tons. To A. Lucas & Sons, Peoria.

For material out of warehouse the quotation is 5c.

Bars.—A Government inquiry, at hand to-day, is for about 1200 tons of steel bars required in making gun forgings, the mills being requested to state if they can make delivery without interfering with other Government requirements. Should there be a conflict, the mills are requested to give notice, after which the Priority Board will be expected to make some readjustment. Shell steel is being placed more freely by the Government. Some high carbon bars, rolled from discarded shell steel, are occasionally sold at 2.90c. Uncertainty exists with regard to both rail carbon steel bars and bar iron, no official prices having been fixed as yet for these products, but recommendations have been made to the Iron and Steel Institute in the case of bar iron, and there also has been some talk as to similar adjustment of rail carbon bars and rerolling rails. Although some makers of rail carbon bars quote 4c., Chicago, and higher, in a nominal market, sales have been made at 3.50c., Chicago. Nominally, iron bars are unchanged at 4.50c., Chicago. Jobbers' quotations are unchanged.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—The sheet mills are filling up rapidly with orders for first quarter delivery, and a prominent local producer expects to be out of the market by the end of the month, as at the present rate its capacity will then have been reached. All of the business is being taken at the recently announced Government levels—5c. for black sheets, 4.25c. for No. 10 blue annealed, and 6.25c. for No. 28 galvanized, all Pittsburgh base, and subject to a freight rate of 21.5c. per 100 lb. The producer referred to is making no contracts, and will ship in the first quarter only those orders which are specified at the present time. The buyer is expected to pay the Government tax of 3 per cent on the freight rate. A little export business is being done to neutral countries, or to commercial consumers in the allied countries, in which cases the Government base does not apply. Jobbers are expected to announce revised prices in the near future.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 8c.; No. 28 black, 8.50c.; and No. 28 galvanized, 9.50c.

Wire Products.—The leading interest is quoting $3.50, Pittsburgh, for nails (the base); plain fence wire, $3.25 (named by agreement); painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35. The independents have been quoting on the basis of $4 for nails, but a circular received in this city announced that they are in accord with the new prices. The prices named are to jobbers, per 100 lb.

Cast-Iron Pipe.—Quotations were advanced to-day $5 per ton, the makers having decided that their recent reduction of $15 per ton was too radical. It is intimated that when they last reduced their prices they expected to get Southern pig iron cheaper than has proved to be the case. Wooster, Ohio, is asking alternate bids for 8000 ft. of pipe, wood, steel or cast iron. If 12-in. pipe is taken, about 370 tons will be wanted, and if 16-in. about 575 tons. The 600 tons wanted by Kansas City, Mo., was placed with the United States Cast Iron Pipe & Foundry Co.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $58.50; 6 in. and larger, $55.50, with $1 extra for class A water pipe and gas pipe.

Rails and Track Supplies.—Specifications are active, but little new business is being done. Spikes have been taken at 4.50c. to 5c., Pittsburgh.

Standard railroad spikes, 4.50c. to 5c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Old Material.—The leading interests had supplemented its purchases of heavy melting and shoveling steel, taking about 15,000 tons in all, for which it paid $29 per ton, regardless of grade. The result has been to reduce, if not wipe out, the usual differential between the two. Other consumers have done very little, all waiting for the market to crystallize following the recent price fixing in which a few items were named. While No. 1 railroad wrought was fixed at $35 by agreement, this was for a gross ton, while it usually is sold per net ton, the equivalent being $31.25. Yet the railroads are receiving and consumers have been willing to pay more than $31.25. The American Board of Scrap Iron Dealers has sent out letters asking the dealers to adjust their operations to the agreed prices. Meanwhile there is much uncertainty as to where the market stands, also a feeling that the mills would like to buy. It is felt that rail carbon bars will be revised downward—in fact they must be to enable them to compete with mild steel bar and iron bars when the latter take their destined place—consequently a revision of rerolling rails will be in order. The railroad lists are few and light. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$35.00 to $36.00
Relaying rails	50.00 to 55.00
Old carwheels	27.75 to 28.75
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft.	33.50 to 34.50
Heavy melting steel scrap	28.00 to 29.00
Frogs, switches and guards, cut apart	28.00 to 29.00
Shoveling steel	27.00 to 28.00
Steel axle turnings	20.00 to 21.00

Per Net Ton

Iron angles and splice bars	$34.00 to $35.00
Iron arch bars and transoms	35.00 to 36.00
Steel angle bars	26.00 to 27.00
Iron car axles	42.00 to 43.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	31.00 to 32.00
No. 2 railroad wrought	28.00 to 29.00
Cut forge	28.00 to 29.00
Pipes and flues	18.75 to 19.75
No. 1 busheling	22.00 to 23.00
No. 2 busheling	15.50 to 16.00
Steel knuckles and couplers	29.00 to 30.00
Coil springs	36.50 to 37.50
No. 1 boilers, cut to sheets and rings	18.50 to 19.50
Boiler punchings	31.00 to 32.00
Locomotive tires, smooth	32.00 to 33.00
Machine-shop turnings	16.00 to 17.00
Cast borings	15.75 to 16.50
No. 1 cast scrap	22.50 to 23.00
Stove plate and light cast scrap	17.50 to 18.00
Grate bars	16.00 to 17.00
Brake shoes	17.50 to 18.00
Railroad malleable	26.00 to 27.00
Agricultural malleable	22.00 to 23.00
Country mixed scrap	16.50 to 17.00

Bolts and Nuts.—The demand is more active than heretofore, and under ordinary circumstances an advance might be looked for, but there was a feeling in the trade that, in keeping with the trend in other products, lower prices were not unlikely to come as they have. For prices and freight rates, see finished iron and steel, f.o.b. Pittsburgh, page 1217.

Mr. Rowe Very Ill

PITTSBURGH, Nov. 14. (*By Wire*).—Wallace H. Rowe, president of the Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, is lying seriously ill at his home in the East End in this city from a complication of diseases.

Cleveland

CLEVELAND, Nov. 13.

Iron Ore.—Believing that the greatest efficiency can be obtained from the joint control of the Lake fleet, most of the vessel owners have placed the operation of their boats in the hands of an executive committee which is also given full authority to co-operate with the Government and Allied industries. This committee will direct the shipments of bulk freight including ore, coal and grain. This action has been taken by the Lake Carriers' Association and members holding 85 per cent of the total tonnage have placed their boats under the direction of the committee which is composed of Harry Coulby, Pittsburgh Steamship Co.; John S. Ashley, M. A. Hanna & Co.; H. S. Wilkinson, Great Lakes Steamship Co.; C. D. Dyer, Shenango Steamship Co., and Charles L. Hutchinson, Pioneer Steamship Co. The demands of the grain trade are heavy and many vessels scheduled for ore have been diverted to that trade during the past week. Ore shippers and vessel men are doing all they can to increase grain shipments to the maximum, and the former are releasing boats under charter, so that they may be used for carrying grain. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba-Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The demand for foundry iron is fairly active, having been stimulated somewhat by the recent announcement of the differentials. The call is largely for first-half contracts, but there is considerable inquiry for small lots for prompt shipment. Malleable iron is also in fair demand. Most furnaces are well sold up and are booking as few orders as possible. Very little iron is available for this year's delivery. The melt is heavy and foundries are crowding furnaces for shipments, some being unable to get iron on their contracts as fast as needed. In steel making iron, there is an inquiry from a Maryland plant for 6000 tons of basic for delivery 1500 tons per month starting with December. There is some demand for small lots of silvery iron, but the supply is not plentiful. Some contracts for 8 per cent silvery iron contain the clause that if that iron is not available, 9 to 10 per cent iron is to be shipped in its place. The Southern iron market is inactive. We quote delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phos., Valley furnace	50.00

Coke.—There is a heavy volume of inquiry for foundry coke, but selling agents have none to offer. Doubt is expressed that the new Government price of $7 for foundry coke will help the situation much, as it is claimed that producers are still filled with orders taken at much higher prices before the Government regulation of prices went into effect. The demand is largely for spot coke and the situation has become so serious that at least one foundry, crowded with rush work for the Government, has been compelled to partially shut down because of the lack of coke.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is light, both in new orders and in specifications on contracts. In view of the possible reduction in prices jobbers have been reducing stocks and have not been placing orders on contracts. Inquiries for about 10,000 tons of rivets from Eastern shipyards are pending, but the placing of the orders is being held up pending a possible reduction of prices.

Finished Iron and Steel.—The demand for steel for Government work continues very heavy. A large share of the manufacturing plants in this territory are now devoting 50 per cent or more of their capacity directly or indirectly to Government work, and the portions of their plants used for these purposes are increasing every day. The market is rapidly reaching such a condition that steel will be available only for Government work and for uses in the manufacturing necessities. Most orders now are Government priority orders, these being placed with the mills that are the usual source of supply for the customer. Orders were placed with a Cleveland mill during the week for 30,000 to 40,000 tons of billets for shells, slabs for making plates for the Emergency Fleet, and sheet bars, some of the latter being placed on priority orders for making tin plate to be used in the manufacture of food containers. There is still considerable inquiry for contracts for steel bars, plates and structural material for the first quarter and first half, but mills are taking on no contracts. Some inquiry has also come out for sheet bar contracts for the first quarter. The demand for plates is fairly active, but mills having high-priced contracts report that some consumers are not sending in specifications on these contracts. Prices quoted by Cleveland mills are unchanged, ranging from a maximum of 6c., Pittsburgh, down to the Government price. An Eastern mill is still quoting universal plates at 3.25c. at mill for early delivery in this territory. The volume of sheet business has been stimulated by the fixing of Government prices, a great deal of business having been booked during the week. Mills are now well sold up for the remainder of the year. Mill orders are being booked at Government prices. There is some irregularity in warehouse prices on sheets, and these are quoted down to 6c. for No. 28 black, 5.25c. for No. 10 blue annealed and 7.25c. for No. 28 galvanized. Hard steel bars continue to ease off and are now quoted around 3.50c. One mill that has been selling deformed bars rolled from shell discard at 2.90c. since the establishment of the Government price is now asking a 25c. extra. The bar iron market is very quiet and the price is nominally about 4.25c., Pittsburgh, but a round lot inquiry would doubtless bring out a considerably lower price. Warehouse prices are unchanged at 4.50c. for steel bars and 7c. for plates and 5c. for structural material.

Old Material.—The scrap market is extremely dull. Mills are still well supplied with material and are keeping out of the market. The only inquiry from a large consumer is from an Ohio mill that is offering $27 for heavy melting steel, but apparently is unable to secure any material at that price. Dealers are trying to force up the price on this grade to consumers to the $30 maximum price fixed by the Government, and are asking this price from consumers, and around $29 from dealers. The latter, however, are offering around $27.50 for heavy steel scrap to cover short sales. We quote f.o.b. Cleveland as follows:

	Per Gross Ton
Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.50 to 28.50
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	21.00 to 22.00
Light bundled sheet scrap	20.00 to 20.50
	Per Net Ton
Iron car axles	$44.00 to $45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.00 to 16.75
No. 1 busheling	22.00 to 23.00
No. 1 railroad wrought	30.00 to 31.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	16.00 to 17.00
Stove plate	16.00 to 17.00

Cincinnati

CINCINNATI, Nov. 13—(*By Wire*).

Pig Iron.—The Ohio silvery irons are in excellent demand, but for prompt shipment little business can be transacted, as two furnaces in Southern Ohio are out for repairs. However, a number of contracts have been made for 8 per cent iron to be shipped in the first half at $44.50 furnace. The inquiry for high silicon iron has been better than at any time during the last half of the present year. An Illinois company is included in a large list of smaller melters as wanting 1000 tons of high silicon iron for first half shipment. Prompt shipment of silvery iron is impossible, except on contracts already existing. In the South, foundry iron for prompt shipment is scarce and sales are confined to odd carload lots that the furnaces

can spare. Notwithstanding reports to the contrary, there is considerable iron in the South that can be had for first half shipment, but there is no energetic move on the part of the furnaces or warrant iron holders to dispose of this iron. Southern iron is now selling strictly on the Government's analysis of 1.75 to 2.25 per cent silicon for No. 2 foundry, and the usual advances for an iron higher in silicon are being made. Recent sales include two to Indiana melters of 500 tons each and 800 tons to a Northern Ohio melter, all for first half shipment. Southern Ohio producers are able to take on only a limited tonnage of foundry iron for shipment either this year or in the first half of next year. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

(By Mail)

Finished Material.—The nearby mills are now quoting No. 10 blue annealed sheets at 4.18½c.; No. 28 black 5.18½c. and No. 28 galvanized at 6.43½c., all f.o.b. cars Cincinnati or Newport, Ky. These quotations are only on carload lots and very little business has been transacted so far on the new basis. The local jobbers have not yet fixed a new schedule and sold a number of small lots of sheets at the old prices up until Saturday. The warehouse price on structural shapes remains at 5.15c.; steel bars, 4.65c.; twisted steel bars, 4.70c.; flat bars 2 x 1 in. and heavier and also rounds 3 in. in dia. and over, 5c., and plates 7c. Considerable interest is taken in the warehouse quotation on wire nails. Some jobbers sold last week wire nails at $4 per keg base but the general quotation to-day is 4.20c., which is 30c. above the ruling price two weeks ago.

Coke.—The recent rearrangement of prices of $6 per net ton at oven on furnace coke and $7 for foundry coke will doubtless help to clear the situation to some extent. The new prices on foundry coke may tend to increase the output in different districts, but no quick change may be expected unless the labor situation improves, which is a matter of considerable uncertainty at the present time. Inquiries are still coming in for both furnace and foundry coke, but foundry users are more insistent than furnace coke consumers, as many of them are operating on very short supplies. The Connellsville district seems to be the only one where any coke can be bought and sales from that territory are confined mostly to carload lots. Shipments on old foundry contracts are only reasonably good and frequent complaints are made. Wise County, Pocahontas and New River operators are not now offering any coke for any delivery.

Old Material.—The market is stagnant and the new price arrangement has brought out no business. It has also not had any effect on previous prices, but a rearrangement is expected to be made on No. 1 wrought and on borings and turnings. As a whole, quotations are firmer and as soon as buying commences it is apt to grow in volume at an unexpected rate, because it is stated that many users of scrap will soon run short.

The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	25.00 to 25.50
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50

Per Net Ton

No. 1 railroad wrought	$28.50 to $29.00
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

Birmingham

BIRMINGHAM, ALA., Nov. 12—*(By Mail)*.

Pig Iron.—Iron makers of the Birmingham district in all likelihood will abandon the old nomenclatures of No. 1 and No. 2 foundry for the sale of iron, selling iron instead on the basis of analysis. Foundrymen of the district declare this will probably be the first effect of fixing of differential rates by agreement of the committee of the American Iron and Steel Institute and manufacturers. The differential rates were received in Birmingham last week by iron makers, and while in some respects they are not satisfactory, the producers assert they are doubtless necessary, and they are perfectly willing to abide by them. The differential rates already are being quoted in this market, and preparations for changing the basis of selling iron from the No. 1 and No. 2 basis to that of analyses of makes are under way. The basic price of $33 per gross ton, f.o.b. cars furnace has been in effect in this market for some weeks. J. W. McQueen, vice-president of the Sloss-Sheffield Steel & Iron Co., declared that he had not had opportunity to analyze the differentials suggested by Judge Gary's committee. "However," he said, "we will accept them, although I believe it will be necessary to change the nomenclature, and sell iron on a basis of analysis." Other iron makers, expressed themselves in similar vein, and declared they would conform to the differential rates at once. In the selling end of the iron market in the Birmingham district this week there was little of interest. Very little iron was sold, and makers were occupied mainly with old contracts.

San Francisco

SAN FRANCISCO, Nov. 6.

The announcement that the ship men probably would not accept the finding of the United States Shipbuilding Labor Adjustment Board on the scale of wages for shipbuilders added another element to the uncertainty of the market, and caused considerable uneasiness. The board has been in continuous session here for the past two weeks and it was expected that a working agreement which would be permanent would be reached. The decision arrived at is so unsatisfactory to the workers that another walk out in the near future is predicted. In other respects the market is, as one steel man put it, "Governmental," and is practically unchanged from the conditions which prevailed two weeks ago. Another reduction in the price of sheets and bars is announced by the jobbers, but it is believed that the bottom has now been reached, as the jobbers are not inclined to reduce their stocks further. At present prices some of them are selling both sheets and bars at a loss. This market is bound to strengthen as soon as the railroad freight conditions improve and the Government embargo of export to Japan is modified.

Bars.—The condition of the market on bars has not changed. The price has remained the same whenever a price was tentatively quoted, and the recession which some predicted has not yet materialized in mill quotations. The feeling that bars would go lower has, however, resulted in another reduction in some cases of the jobbers' price, 6c. being generally quoted. It is not expected that this figure will be long maintained.

Structural Materials.—Structural materials are very quiet, although there is considerable demand, judging from the inquiries received. A. B. Fletcher, chief engineer for the State Highway Commission, is trying to have Judge R. S. Lovett release the railroad embargo on open cars, so that sand and gravel may be hauled for road building. If this material could be obtained freely the commission stands ready to give orders for a considerable amount of structural material for the building of bridges. The Mare Island Navy Yard is building nine large structures, the structural material in which was bought for the East and is being fabricated at local shops.

Plates.—The market for plates is unchanged, but it is predicted that prices will probably go lower. As

soon as the old contracts are completed the Government price will prevail, and this means a material reduction. However, as the Government demand is large and expected to increase, private consumers may not receive much advantage. The Government demand is 60 per cent and more of many of the mills now, so the local dealers argue that, with the increased Governmental need there will be little or nothing for the general public, once the present stock is consumed.

Sheets.—The general condition of the market on sheets keeps pace with that on plates. Among the jobbers, however, there has been a further reduction. For No. 28 gage a quotation of 10.50c. was made to-day. Blue annealed sheets are also showing weakness among the jobbers.

Wrought Pipe.—Representatives of large manufacturers of tubular goods find it difficult to promise delivery of wrought pipe under 16 or 18 months. They are taking orders for small pipe on a 20-week delivery basis. Like all other materials in the iron and steel trade, Government orders are taking precedence, and the fact that a contract for 70 new ships has just been made convinces the local representatives and jobbers alike that wrought pipe will be scarcer on this coast.

Cast Iron Pipe.—Very little business is offered for cast iron pipe. Many cities are in need for large supplies for their water distribution, but at the present prices they cannot afford to buy. The city of Hollywood, in the southern part of this State, for instance, recently voted $3,000,000 to extend its water mains. Between the time the ordinance was passed authorizing the bond election and the voting on the matter the price of cast iron pipe advanced so much that the city could not with the amount allowed buy enough pipe to fulfill the letter of the law. A second election to increase the bond issue is mentioned, but the proposition is not meeting a hearty response. There are other municipalities which are in need of pipe, but they are holding off in hope of a slump. The general opinion here is that an advance in price rather than a recession is more likely to come with the new year. However, cities must have pipe sooner or later.

Pig Iron.—The market on pig iron is settling down to prices based upon the Government War Board agreement with the American Iron and Steel Institute. No. 2 foundry is being quoted at about $34 and No. 1 at about $36. There is much more inquiry than business, but it is expected that buyers of pig will be in the market for considerable quantities in the near future. Ferromanganese is temporarily down, but increased prices are expected during the winter on account of the difficulty of getting the ore.

Old Material.—The market for scrap is well supplied with material and prices are steady. The scrap men have got together on the question of price and a steadier market in old materials is expected to result.

Buffalo

BUFFALO, Nov. 12.

Pig Iron.—Inquiry is heavy and coming from all directions, both for early shipment and for first half and third quarter delivery next year; but finding very little available tonnage for early shipment in the Buffalo district, furnace companies being out of the market for 1917 shipment. One furnace interest has sold an aggregate of 2500 tons of foundry grades, some of it being No. 1 foundry at $34 50 and some of it No. 2 X, at $33.50, furnace; a portion was for prompt shipment from the stack at Troy, which has been obliged this week to go out of blast on account of inability to secure coke, and will probably remain out for two or three weeks. Nearly all producers are making sales for 1918 shipment, but are not urging buyers to place orders, merely quoting on inquiries presented and favoring old line customers, it being very difficult for melters who have not bought from regular sources of supply to get their requirements filled. The Government scale of prices and grade classification controls quotations for contracts for third quarter delivery as well as for first half. The coke situation continues to be very troublesome, the shortage both for furnaces and foundries being severely felt. Furnaces are idle in the Buffalo district and foundries face shut-downs through lack of fuel. Shortage of labor at ovens and at the mines is the principal cause of the trouble. The pressure on furnaces for shipment on contract iron is extremely heavy and with a limited production furnacemen are trying to prorate equitably the tonnage produced to the best of their ability. Practically all requisitions for shipment are covered by Government order numbers, showing that the tonnage is going directly or indirectly into Government use. Three of the furnaces of the district are out of blast—one for relining and two for lack of coke. The price schedule is the same as for a week ago, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—A number of inquiries, ranging from 100 to several hundred tons each, are appearing in the market, for structural material for replacement of stocks for fabricators. So far as known, the inquiries have not found placement on mill books, because of the desire of the mills to conserve their output for the production of orders already on the books and to supply government demands. It is reported a contract has just been awarded for 12,000 tons of shipbuilding material for shipment to Canada, delivery to commence in October, 1918, and to be forwarded at the rate of 1000 tons per month.

Old Material.—The week has shown good demand for heavy melting steel, machine shop turnings and cast-iron borings, although there have been no large sales of any grade. Heavy melting steel is selling at $29 to $30, which is about $1 per ton higher than quoted for the week previous, the Government price for that commodity as announced being about that much higher than the ruling price in this market a week ago. No. 1 railroad wrought is now held at $34 to $35; machine shop turnings at $18 to $18.50, and cast-iron borings at $19 to $20. The Government price established on the four commodities mentioned above has not affected the prices on other grades of scrap; but it has had a restraining effect on speculation by dealers, as in order to make any profit the speculative dealer must buy at a price under the price fixed by the Government. Labor shortage, lack of cars and general transportation conditions are still interfering with prompt deliveries on out-of-town contract obligations, but the local consuming market is absorbing a large percentage of the scrap materials now originating here. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wroughth	34.00 to 35.00
No. 1 railroad and machinery cast	27.00 to 28.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	25.00 to 26.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

British Steel Market

Advance in Maximum Pig-Iron Prices Expected —Tin Plates Higher and Firmer

(*By Cable*)

LONDON, ENGLAND, Nov. 14.

The pig-iron market is strong and an official general advance of fully 10s. is expected owing to the advance in coke. American semi-finished steel is nominal. Steel bars have sold to India at £35, c.i.f., early shipment. Ferromanganese is unsettled. Canada has paid $290,

c.i.f., for forward shipment. Tin plates are firmer at 30s. 9d., allowing for an advance of 10s. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales 28s. 9d.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Price of Coal Advanced—Tin-Plate Output Larger—The Ferromanganese Position

(By Mail)

LONDON, Oct. 23.—The stringent conditions may become still more accentuated with the ever increasing demand for war purposes. While steel production is apparently still short of current needs, the use of this material is being more and more restricted in some trade branches and exports are being kept down. This also probably accounts for the fact that the allocation of supplies of ferrochrome is now under Government control, while users have been requested for particulars of their stocks, contracts, etc.

A new feature of influence in the general situation is the recent advance of 2s. 6d. a ton in the cost of coal which points to an increase in the cost of pig-iron production and a revision of the maxima. This would involve a similar procedure in allied products, unless it be found possible to bring about adjustments in the various branches without disturbing the present maxima, as suggested by some who do not relish a general revision. The consumer must expect, however, to pay more for his supplies. Under this influence the demand for pig iron, after a short-lived lull, is on the increase but makers are disinclined to book orders except subject to an official change. The tone is strong, even in forge iron, due to increased demand. Consumers of Cleveland foundry grades are comfortably situated, the supply here being ample, although deliveries are retarded by car scarcity.

Ferrosilicon Prices

It is understood that the maximum price of blast-furnace ferrosilicon is £10. 10s. for 9 per cent, and £12 for the 12 per cent grade, net f.o.t., but this requires official confirmation. The position of hematite is intensely stringent but nominally unchanged. Demand is heavy but allocations are kept down. A new blast furnace has been put on basic iron by the Stanton Ironworks Co. in Derbyshire, which, before the war, had nine furnaces on foundry iron but, owing to the shortage of basic iron for steelmaking, allocated at the request of the Government two furnaces in the last six month for this purpose, so that three are now operating.

Little semi-finished steel is to be had for ordinary trade needs, although output is at a high rate. Supplementary allocations representing about 1000 tons a week were recently made to the Welsh tin-plate mills. Government needs, of course, make the continuation of stringent conditions inevitable. Official prices of sheet bars and billets are unchanged. The reluctance of British consumers to pay the full terms asked, until a week or so ago, for American wire rods has induced concessions and small sales have ensued at £28 to £27 c.i.f. Liverpool for shipment this quarter with further offers now at £26.

Finished iron and steel is strong, probable higher costs of raw materials tending to add to the reticence in booking new orders, in view of the intense accumulation of orders. War work is given primary attention and there is very little scope for mercantile business, in spite of constant efforts toward plant extensions. Within the next few months productive capacity should be developed further but there is no prospect of a revival of merchant business. It is reported that John Brown & Co., intend to erect a steel plant at their Trent Ironworks and may transfer other steel operations thither from Sheffield.

Electric Furnace in Cleveland District

The recent introduction of the electric furnace in the Cleveland district deserves notice. Under the basic process, steel of the highest quality can be made from the phosphoretic Cleveland ore. The steel is said to be purer chemically than that secured by the acid process. By the use of the electric furnace high quality carbon steels can be produced which, as regards purity, are almost equal to best Swedish charcoal steels.

As cabled, the allotments of steel bars to the tin-plate mills were increased by about 7½ per cent and the mills' output since Oct. 15 has been about 37 per cent of normal, the increase representing roughly 20,000 boxes a week, chiefly intended to facilitate the covering of Allied requirements. The market is very firm, makers not being eager to contract further, pending a settlement of the wage question through Government action. The men insist on an increase in their war bonus to 100 per cent on the basis of which makers would expect the official maximum to be raised by at least 1s. 6d. per basis box. The increase in the cost of coal is another argument for price revision.

Revision of Ferromanganese Price

Ferromanganese is extremely quiet, and somewhat unsettled because a revision of the home trade price is now under consideration. The fixed price for the home trade for a long time has been £25, which is considered now unduly low. Until a decision has been reached, sales to the home trade have been practically suspended. There is virtually no change in export business except that rather easier terms are being entertained round about $350 for shipment to American North Atlantic ports. The market is chiefly nominal with the quotation to continental ports about £80 f.o.b. for loose.

Philadelphia

PHILADELPHIA, Nov. 13.

Between 50,000 and 60,000 tons of basic iron have been sold in this market during the past week, 45,000 tons of which were taken by an Eastern plate mill at the $33 price at furnace. A bridge company which is usually supplied by its own furnaces came into the market for 8000 to 10,000 tons of basic, but received only a part of this quantity. This iron was wanted for prompt delivery to relieve a serious shortage. Announcement of fixed prices for old material has been followed by a better demand and prices have strengthened. Heavy melting steel was sold here a few days ago at $27, delivered in the Philadelphia district. No. 1 railroad wrought, fixed at $35, will probably be hard to get at that price. The fixing of prices for warehouses is covered fully in another column of this issue.

Coke.—A New York coke company has been quietly selling for next year in this district, and another seller is about to do likewise. Coke for prompt delivery is not to be had, however, though some relief is promised through the efforts of the authorities at Washington in giving priority of shipment to coke until such time as the present serious shortage is overcome. The Fuel Administration has fixed the price of 72-hr. foundry coke at $7, ovens. Blast furnace coke was fixed by the President at $6.

Pig Iron.—An Eastern plate mill came into the market last week for its first quarter requirements of pig iron, taking about 45,000 tons of basic, most of which was sold by one company. The price was $33, at furnace. Other sales of basic and of a few thousand tons of phosphorus were made during the week. A bridge company came into the market for 8000 to 10,000 tons of prompt basic to meet urgent requirements due to troubles at its own furnace. A Philadelphia company is in the market for 6000 tons of basic for first quarter. The inquiry for next year is active and involves a considerable tonnage, while for prompt delivery a large quantity of iron could be sold if it were available. Foundry iron is being sold mostly in small lots, from a carload to 500 tons, some of which is for this year and some for next. One Eastern Pennsylvania furnace has sold about 20,000 tons of foundry iron in the past three weeks, mostly in small lots. The question of commissions for brokers has not been settled by Government edict, as on coal and coke, so brokers are charging their usual commissions, about 2½ per cent on foundry iron and 1 per cent on basic iron, in addition to the price of the iron,

the commissions being charged as "service." Brokers and merchants are also able to make some profit through the differentials permitted, but not specifically fixed, on variations of silicon, manganese, phosphorus and sulphur. We quote the following standard grades at furnace, the freight to destination to be added:

Eastern Penna. No. 1 X	$34.50
Eastern Penna. No. 2 X	33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Ferroalloys.—Although reports of price fixing of ferromanganese have been in the air for some weeks, it is now regarded by producers as improbable that the Government will find it necessary to do so. Unofficially, it is said that when the price of ferromanganese was about $350 per ton the makers received a strong intimation from Washington that unless this was substantially reduced, the Government would establish a control price. A few large producers have gradually worked the quotation down to $250, and even this has been shaded at least to $249. Consumers have not shown a disposition to contract for next year, but makers believe they will do so as soon as they become convinced that price fixing is not in prospect. Spiegeleisen has weakened and the market is now quoted at $65 to $70, furnace, but the inside price could probably be obtained only on desirable orders. The prices quoted apply for any delivery.

Billets.—Makers of re-rolling billets find it more profitable to use any surplus, after deliveries are made on old contracts, in their own mills. Under present conditions, it is doubtful whether there will be any billets offered for sale in this market for some time to come. The $47.50 price is not attractive to makers, and they will not sell as long as they can make more profit by conversion into finished material. Forging billets, mostly in small lots, have been sold at prices varying from $75 to $97.50 per ton, the higher quotation applying on special quality.

Sheets.—Fixing of prices was followed by a fairly large number of orders, mostly under 500 tons, for delivery over the remainder of this year. An eastern Pennsylvania mill has accepted orders from regular customers for blue annealed sheets for the first quarter of next year.

Structural Material.—Opinions differ among representatives of mills rolling structural shapes as to the quantities which will be available for general building construction. The extreme view on one hand is that there will be a decided scarcity, and on the other hand that there will be sufficient after Government requirements are satisfied to take care of such building as is likely to be considered necessary during the war. Only one mill in this district is prepared to take contracts, at the Government price, with definite dates of delivery, and of course this mill alone could not take care of anything approaching normal demand. Other shape mills are either loaded up with Government work at the present time, or see so much of this work coming to them in the near future that they are not willing to commit themselves. The Government has changed the plans for the new machine shop at the Washington Navy Yard to concrete construction. The McClintic-Marshall Co. received an order for about 1800 tons for a plate and angle shop at the Hog Island shipyard of the American International Shipbuilding Corporation.

Plates.—Orders for about 70,000 tons of plates have been divided among several mills by the Emergency Fleet Corporation for the first 25 ships to be constructed by the American International Shipbuilding Corporation at Hog Island. Mills have also received orders for plates for submarine destroyers. Offerings of plates for prompt delivery are a little freer. Such plates are extra rollings and are sold, in most instances, only to regular customers. An eastern Pennsylvania mill, though selling plates this way, refuses to contract ahead. It seems beyond question that there will be a great shortage of plates next year for ordinary commercial purposes. Many inquiries are being turned down. Reports from Washington indicate that a limited tonnage of plates, possibly 150,000 tons, will soon be released for shipment to Japan. Probably plates already in storehouses on the Pacific Coast will be the first released. Shipment of plates for Japan to the coast on domestic bills of lading has been stopped. Only those shipments for which cargo space has been reserved will be carried by railroads. The Government has ordered 15,000 tons of ship plates for shipyards in Italy from an eastern Pennsylvania mill. The Baldwin Locomotive Works and the American Locomotive Co. will each build 750 locomotives for Russia. A large car order for Italy is also pending.

Old Material.—A better inquiry for iron and steel scrap followed the announcement of fixed prices by the Government. About 1000 tons of No. 1 heavy melting steel was sold last week for delivery at Coatesville, Pa., at $27. Some dealers are asking up to $29, the fixed maximum being $30 at consuming port. Machine shop turnings and cast borings have not as yet been materially affected by the fixed price of $20 per gross ton. Rolling mill turnings have been selling at $18 to $20 and cast borings at $20 to $22. Dealers say that cast borings adapted for special purposes, as for chemical plants, will continue to take an extra of about $2 per ton above the maximum price, or $22. No. 1 railroad wrought was fixed at $35, though recent sales in this district have ranged from $38 to $43. Some dealers say that No. 1 wrought will be scarce at $35 and consumers may be forced to take yard wrought, which is now quoted at $30 to $32.50 delivered, with predictions that it will go higher. There is a good demand for No. 1 wrought at the fixed prices, but no sales are reported. A good demand from carwheel makers, who are short of charcoal pig iron, for old carwheels has stiffened the price about $1 per ton. Low phosphorus scrap, No. 1 cast, grate bars and stove plate are higher. Railroad malleable is lower. The large dealers in this market assert their determination to adhere absolutely to the Government recommendations, but a little confusion has resulted from the attitude of the small merchants, who have in some instances insisted on the full maximum price for their material. In some quarters, it is believed that the fixing of prices will have the effect of diverting business away from the dealer and broker and that mills will be more apt to buy direct from large producers. Efforts are being made by dealers to induce producers to accept the new conditions and facilitate the normal movement of scrap. The inspection bureau of the American Board of Scrap Iron Dealers is now in working order in the office of Secretary C. A. Barnes, Widener Building, Philadelphia. Purchasing agents are being asked to co-operate in reducing car rejections to a minimum. The committee on iron and steel scrap of the American Iron and Steel Institute will now take up priority matters with Washington. Confusion has resulted from the order of Judge Lovett of the War Industries Board for the use of all open freight cars for coal, coke, ores, etc. Scrap iron was excluded, though it is held to be just as important to blast furnaces and steel mills as coal or coke. Scrap dealers have had difficulty in shipping to blast furnaces, which directly have no Government orders, but which are shipping pig iron to war plants. Shippers are now required by the railroads to make affidavit that scrap is intended for war work before a permit is granted. We quote for delivery at consuming points in this district the following prices:

No. 1 heavy melting steel	$26.00 to $28.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	36.00 to 40.00
Old iron rails	38.00 to 40.00
Old carwheels	30.00 to 33.00
No. 1 railroad wrought	35.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Steel turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	20.00
No. 1 cast	30.00 to 32.00
Grate bars	21.50 to 22.50
Stove plate	20.00 to 23.00
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

Iron and Steel Bars.—By request of the Government makers of bar iron have recommended a fixed price for their product, and the result is announced in another column as 3.50c. Many in the bar iron trade believed this commodity might escape Government regulation. Price fixing of bar iron was foreshadowed, however, by the announcement of a Government price of $35 on No. 1 wrought scrap. Upon this basis, bar iron producers could not expect to continue getting 4.50c. to 5c., the prices which have been ruling.

St. Louis

ST. LOUIS, Nov. 12.

Pig Iron.—The announcement of the differential prices on the various grades and classes of pig iron brought no difficulties into this market which had not already existed and the furnace representatives generally accept the figures given out as being as fair as could be expected under the circumstances. The problems now confronting them are more in the way of getting metal than a matter of price, for inquiries continue to flow into the market in heavy aggregates, but very few sales are being made, in comparison with the total asked for. Probably 5000 tons was sold during the week in lots ranging from carloads up to 1000 tons, with deliveries extending through the first half of the coming year. There is, as yet, no disposition to take business beyond that period. The inquiries still pending and for the present with little hope of execution include 20,000 tons of basic, 1000 to 2000 tons of malleable, 2000 tons of No. 2 foundry and a large number of lesser quantities aggregating probably 20,000 tons.

Old Material.—While conditions in the scrap market are somewhat improved, there is still considerable uncertainty while dealers and consumers are adjusting themselves to the fixed prices announced by the Government and figuring the prices to be placed on scrap not specifically covered by the schedule. In consequence quotations are not to be made at present as definitely the market, but rather as an estimate of values which may be revised when the Government figures are more completely digested. We quote dealers' prices, f.o.b., customers' works, St. Louis industrial district, as follows:

	Per Gross Ton
Old iron rails	$36.00 to $37.00
Old steel rails, re-rolling	36.00 to 36.50
Old steel rails, less than 3 feet	37.00 to 37.50
Relaying rails, standard section, subject to inspection	60.00 to 75.00
Old carwheels	28.00 to 28.50
No. 1 railroad heavy melting steel scrap	27.50 to 28.00
Heavy shoveling steel	25.50 to 26.00
Ordinary shoveling steel	24.00 to 24.50
Frogs, switches and guards cut apart	27.50 to 28.00
Ordinary bundled sheet scrap	18.00 to 18.50
Heavy axle and tire turnings	18.00 to 18.50
	Per Net Ton
Iron angle bars	$34.50 to $35.00
Steel angle bars	27.00 to 27.50
Iron car axles	43.00 to 43.50
Steel car axles	41.00 to 41.50
Wrought arch bars and transoms	42.00 to 42.50
No. 1 railroad wrought	30.00 to 31.00
No. 2 railroad wrought	28.00 to 28.50
Railroad springs	30.00 to 31.00
Steel couplers and knuckles	28.50 to 29.00
Locomotive tires, 42 in. and over, smooth inside	30.00 to 31.00
No. 1 dealers' forge	21.00 to 21.50
Cast iron borings	16.50 to 17.00
No. 1 busheling	23.00 to 23.50
No. 1 boilers, cut to sheets and rings	18.50 to 19.00
No. 1 railroad cast scrap	20.50 to 21.00
Stove plate and light cast scrap	17.00 to 17.50
Railroad malleable	25.50 to 26.00
Agricultural malleable	21.00 to 21.50
Pipes and flues	21.00 to 21.50
Heavy railroad sheet and tank scrap	18.50 to 19.00
Railroad grate bars	18.00 to 18.50
Machine shop turnings	16.50 to 17.00
Country mixed scrap	17.50 to 18.00
Uncut mixed railroad scrap	20.00 to 20.50

New York

NEW YORK, Nov. 14.

Pig Iron.—Sellers of Alabama irons who have endeavored to dispose of their product in New York and New England territory during the past week on the basis of $32, Birmingham, for No. 2 foundry have found themselves up against a stone wall for the reason that buyers were unwilling to contract on that basis plus the high freight rates which must be paid. Effective Nov. 25, the rail and water rate from Birmingham to interior New England points will be advanced to $6.40, while the rate to New York will be advanced to $5.75. The rates to New England points are now variable, being $6 to Boston, $5 to Pawtucket and $5.25 to Springfield, while the present rail and water rate to New York is $4.25. These high rates are not, however, very important for the simple reason that there are no boats available for carrying pig iron and the all rail rate, which is not to be changed, so far as know, continues, it being $6.15 to New York, while to New England it is $6.40 and to Philadelphia, $5.20. Alabama irons are unable to compete with Northern irons at this rate and their only hope is that the supply of Northern iron will be exhausted and that melters will be compelled to place their orders for the Southern product. During the past week, there has been very fair buying of Virginia irons, including 6000 tons for next half delivery, foundry grades, from one furnace company. Of eastern Pennsylvania irons the buying has been largely for small lots, all at Government prices. For early delivery we quote as follows, tidewater, the Virginia price having been advanced to correspond with the recent advance of 52c. in freight from the gateway to the North, all Eastern shipments:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern (rail and water)	37.25
No. 2 Southern (all rail)	39.15
No. 2 X Virginia	37.00 to 37.25

Ferroalloys.—The domestic ferromanganese market is a little more active with sales in the last week aggregating 1200 to 1500 tons, mostly in small lots. The majority of this went at $250, furnace, and was largely for next year's delivery. Italy has taken 200 tons for prompt shipment and has been receiving considerable ferromanganese in recent months from this country. Offerings to pay $225 to $240 have not been successful and the market is quoted at $250 for all positions. Spiegeleisen, 20 per cent, has also been active. Besides the large sale noted a week ago, at least 5000 or 6000 tons has been sold this last week, all for next year's delivery except 400 to 500 for November to January shipment. These sales were made at about $60 to $65, furnace, which is the quotation for next year's delivery with earlier material commanding about $70, furnace. Ferrosilicon, 50 per cent, is in active demand for 1918 delivery with inquiries aggregating about 1500 tons before the market. Producers are quoting $150 for next year, but it is understood that this alloy has been sold recently as low as $140. For this year, $175 is asked.

Finished Iron and Steel.—Little buying on domestic account is noted. Settlement among manufacturers of forms of steel not covered by the fixed prices already announced appears to proceed slowly, some producers resisting the reductions as being altogether too great. Jobbers' prices, partly in preparation for the revision, have been lowered to the levels maintained recently by the larger warehouses. The 30,000 cars for Russia were finally closed late last week and the distribution has been made for 4975 cars for the United States expeditionary force in France. Italy is in the market for 3000 to 5000 cars. Japan is sounding the market for 15,000 to 30,000 tons of rails, on part of which early delivery could probably be obtained. A contract for 900 tons for a 15-story hotel on Seventy-third Street, east of Amsterdam Avenue, New York, to the Hinkle Iron Co., for the Hotel Hamilton Corporation stands conspicuous in a section of the country in which little building work has been done for some time. The hangars for Langley Field, 3500 tons, are about closed; it is understood that Lewis F. Shoemaker & Co. will provide 750 tons of the work. Awards have been made for 220 steel derrick towers for the Hog Island shipyard development and the American Bridge Co. will provide 75 of them, requiring 2100 tons. John Eichleay, Jr., Co. has also one of the contracts. Other new work includes 3100 tons for the Anaconda Copper Mining Co. to the American Bridge Co. and 200 tons for four bridges for the Long Island Railroad to the Bethlehem Steel Bridge Corporation. Bids were taken on Nov. 12 on 200 tons for a storehouse and 200 tons for a foundry

addition for the Washington Navy Yard. What business is done appears now to be going at the fixed prices, but we note higher prices for export, as, for example, 300 tons of plates at 5.75c., Pittsburgh, to go into storage to be exported on obtaining license. We quote mill shipments of steel bars at 3.095c., New York; shapes, 3.195c.; plates, 3.445c., and bar iron at 4.695c. to 4.945c., New York. Out of store we quote iron and steel bars at 4.75c., New York, shapes 5c. and plates 8c., with a possibility that 7c. in plates may be done.

Old Material.—Following the action of the Government in naming quotations on heavy melting steel, borings, turnings and No. 1 railroad wrought, there has been very little activity. While no one is paying more than Government prices—and this applies to dealers who sold short some time ago at higher prices than those named by the Government—the Government quotations are being shaded and prices remain as for several weeks past. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$24.00 to $24.50
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 25.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long	25.00 to 26.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries, about $3 more is quoted:

No. 1 machinery cast	$25.00 to $26.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	19.00 to 20.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast Iron Pipe.—On 812 tons of 4-in. pipe and 1200 tons of 6-in. pipe for the Government, bids were submitted last Saturday as follows: Lynchburg Foundry Co., $109,687; National Pipe & Foundry Co., $111,711; Central Foundry Co., $112,875; R. D. Wood & Co., $113,287; United States Cast Iron Pipe & Foundry Co., $115,968; Stokes & Ivy, $117,956. The award has not yet been announced but will undoubtedly be made to the Lynchburg company. Considering that this is Government business, the bids are not very low. On ordinary business, New York quotations are still $56.50 on 6-in. and heavier and $59.50 on 4-in.

Plans of the Pittsburgh Export Co.

PITTSBURGH, Nov. 14.—(*By Wire*).—Associated with A. H. Dillon, formerly assistant general sales manager of the Youngstown Sheet & Tube Co., who resigned to become president of the Pittsburgh Export Co., will be Charles J. Graham, president of the Graham Nut Co.; J. Rogers Flannery, president of the Flannery Bolt Co.; E. J. Lanahan, president of Fort Pitt Malleable Iron Co., and J. M. Hansen, president of Standard Steel Car Co., all of Pittsburgh. The company will engage in a general iron, steel and machinery domestic and export business. At present, it is buying steel for 50 merchant vessels building for the Emergency Fleet Corporation. This work is being handled by Mr. Dillon, who will be in charge of the Pittsburgh office.

The Nordberg Mfg. Co., Milwaukee, a large manufacturer of steam, gas and oil engines and machinery, has installed a complete hospital and infirmary in connection with its main works at Oklahoma Avenue and Chicago Road, Milwaukee. The building is of the bungalow type and located between the foundry and machine shop, and is equipped with all modern surgical appliances.

IRON AND INDUSTRIAL STOCKS

Unfavorable War News Responsible for Further Recessions

NEW YORK, Nov. 14.

Following the sharp declines of week before last, which were generally attributed to short selling, there was further recession last week, forcing many stocks to the lowest level in years. This latest slump is attributed almost entirely to the unfavorable war news, especially that relating to Russia and Italy, which indicated that the war might be continued indefinitely. Transactions in the week of United States Steel common amounted to 1,400,000 shares ranging from 95⅞ to 88¾, and recording a net loss of 3⅛ points. Other shares were equally active and weak and in some cases the lowest from the high points of the year were as high as 75 points. Friday and Saturday there was a pretty general rally and the week ended with a somewhat better feeling.

Developments in the bond market were like those in the stock market and declines of two and three points were common as the result of the week's transactions.

Among the very few industrial stocks that recorded gains were the American Car & Foundry Co., ¼ point and the Midvale Steel Co., ⅜. Among the stocks which recorded losses were the following: American Locomotive pref., 2; Baldwin Locomotive com., ⅜; Bethlehem Steel com., 1; Bethlehem Steel class B, ⅝; Bethlehem Steel pref., ¾; Colorado Fuel & Iron, 1½; Crucible Steel com., 3½; Gulf States Steel, 5; National Acme, ½; Pressed Steel Car com., 1; Pressed Steel Car pref., 8¼; Republic Iron & Steel com., 1⅞; Republic Iron & Steel pref., 2½; Superior Steel, 2¾; United States Steel com., 3⅛; United States Steel pref., 3; Westinghouse Electric & Mfg. Co., 1⅞.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal. com.	16 - 18⅜	Int. Har. of N. J. com	103¾-106
Allis-Chal. pf.	71 - 76	Int. Har. Corp. com.	52 - 55
Am. Can com.	29½- 35¼	Lacka. Steel	68 - 72½
Am. Can pf.	92⅞- 93	Lake Sup. Corp.	10½- 11⅝
Am. Car & Fdry. com.	59 - 63½	Midvale Steel	39⅞- 44⅝
Am. Car & Fdry. pf.	104	Nat.-Acme.	26½- 28⅝
Am. Loco. com.	49 - 52½	Nat. En. & Stm. com.	32¾- 37
Am. Loco. pf.	94½	Nat. En. & Stm. pf.	95
Am. Radia. com.	270½-280	N. Y. Air Brake	98¼-106
Am. Ship com.	88 - 89	Nova Scotia St.	72 - 74½
Am. Steel Fdries.	51 - 54¾	Pitts. Steel pf.	94
Bald. Loco. com.	49¼- 56¾	Pressed St. com.	49¾- 55
Beth. Steel com.	74 - 82½	Ry. St. Spr. com.	36½- 40
Beth. St., class B.	72½- 82½	Republic com	65¼- 72½
Beth. Steel pf.	89 - 90	Republic pf.	94 - 95
Cent. Fdry. com.	26 - 27	Sloss com.	33½- 37
Cent. Fdry. pf.	36 - 39	Superior Steel	30¼- 33½
Char. Iron com.	6⅞- 7¼	Transue-Wms.	37½- 39
Chic. Pneu. Tool.	43 - 46	Un. Al. St. 1st pf.	36¼- 37
Colo. Fuel	29¾- 33½	U. S. Pipe com.	10⅝- 13⅜
Cruc. Steel com.	49½- 56¾	U. S. Pipe pf.	48 - 45½
Crucible St. pf.	85	U. S. Steel com.	88⅝- 95⅝
Deere & Co. pf.	98 - 99½	U. S. Steel pf.	108⅝-109⅝
Gen. Electric	122¼-130	Va. I. C. & Coke	50
Gt. No. Ore. Ct.	22¾- 25¼	Warwick	8⅝
Gulf States Steel.	77 - 81½	West. Electric	36 - 39¼
Gulf S. St. 1st pf.	101½		

Industrial Finances

The Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has issued a statement showing sales for three months ended Sept. 30, 1917, as $10,979,461.42, an increase over the same period in 1916 of $4,605,258. Net profits for the three months ended Sept. 30 were $2,048,844.92, after setting aside $1,385,239.75 for estimated war profits and income tax. In other words, the gross profits of the Pittsburgh Steel Co., for the three months ended Sept. 30, 1917, were $3,434,084.67.

The Savage Arms Corporation reports total earnings of $845,829 for the quarter ended Sept. 30, compared with $462,105 for the previous quarter and $2,031,858 for the three months ended March 31 last. The balance available for dividends on the common stock was $564,486. For the nine months ending with September the company earned the equivalent of $25.40 a share on the junior shares.

Sales of the Pittsburgh Steel Co. for the quarter

ended Sept. 30, 1917, amounted to $10,979,461, an increase of $1,605,258 over the same period of last year. Net profits, after setting aside $1,385,239 for estimated war profits and income taxes, amounted to $2,048,844, a decrease of $164,208.

A committee has been formed to take charge of the financial affairs of ex-Governor Eugene Foss of Massachusetts. The committee will take over his securities and the business affairs, including stock of the Sturtevant Blower Co. and the Mead, Morrison Co. Recent weakness of the market is given as the reason for Mr. Foss's embarrassment. The Sturtevant Blower Co. is in splendid condition, and has no obligations outside of current bills, and has two years of work on hand. It is understood that the ex-governor's liabilities are about $10,000 and that the $17,000,000 of assets have shrunk to about $13,000,000. The Mead, Morrison Co. is also in fine condition.

Gross sales of the Pittsburgh Rolls Corporation, of Pittsburgh, which took over the Seaman-Sleeth Company properties some months ago, for the four months ended Sept. 30, amounted to $479,476, and net sales to $441,661. After deducting all selling expenses and administrative costs, including income and excess profits taxes, there remained a net profit of $97,818. Adding "another income" brought the gross income for the four months up to $112,618. Bond interest, normal sinking fund charges and preferred stock dividends call for $10,000 a month.

Crucible Steel Co. of America Annual Report

The annual report of the Crucible Steel Co. of America, Pittsburgh, for the year ended Aug. 31, 1917, has been issued. A statement showing the disposition of the net profits for the year is as follows:

Net profits for the year accounted for as below	$12,282,357 86
Cash dividends on preferred stock (30¼ %)..	$7,562,500 00
Increase in current assets.....	1,316,123 25
Reduction of coal land purchase notes.....	286,000 00
Invested in additional property.....	1,614,174 87
Increase in investments and construction advances to associated companies.....	4,092,820 07
	$15,194,757 23
Deduct:	
Increase in reserve funds.....	2,912,399 37
	$12,282,357 86

Herbert Dupuy, chairman of the executive committee, said in part:

The Crucible Steel Co. was among the very first to place its large manufacturing facilities at the disposal of the Government to be put to such use as might best suit national needs. It has always furnished a great deal of material to and for our own Government, so that when the crisis came it was in the best position to offer prompt assistance. To show the extent of what we are doing, one of our plants alone, the Atha Works, at Harrison, N. J., is to-day supplying directly to the United States Government about 83 per cent of its entire output, in addition to 15 per cent to Government contractors, so that practically the entire output of that large plant goes directly to the assistance of the United States to cover its present war needs.

In our report of last year we expressed the difficulty then confronted of finding the high grade of materials required to make crucibles, in which such a large part of our steel is made. The same trouble continues this year as faced us then. No new clays, yet discovered, produce a crucible as durable as that made from clay mined in Germany. We have experimented with a hundred or more domestic varieties, taken from the four corners of the United States, but have yet to find one which will give the results which were obtained before the war in the use of foreign clays. Besides this, American clays are several times higher in cost than was the German product formerly used. Owing to the poor heat-resisting qualities of the material and its high cost, the crucible steel products of your company, being by far the largest value of its output, now cost such high figures to produce that it is difficult to secure for them a remunerative figure from the public.

For a number of years your board of directors has been endeavoring to devise a comprehensive plan, under which a direct relation might be established between the earnings of the company, and the compensation paid to those of its employees charged directly or indirectly with the responsibility of managing its affairs, the prime object of this being to recompense faithful employees who have been in the service of the company during at least two years. Based upon these considerations a plan has been evolved through which the loyalty and efficiency of the company's employees are recognized and through its scope their best efforts in the service of the company will be developed. Your board considers this to be one of its most far-sighted and profitable investments in the interest of the efficiency of the company and one which is bound to reflect favorable results.

Many of the improvements referred to in our report of last year are still unfinished, owing to the difficulty in securing raw material of every kind in connection with all new construction and installation, and men to do the work.

ATHA WORKS.—During the year, in order to assist the Government in securing additional munitions of war, contracts have been made covering large additions to this plant, including additional buildings for open hearth and electric furnaces, a large forge shop, new hammer-house and a modern warehouse, all of which, together with the machinery to be installed in them, will entail an expenditure of between $2,000,000 and $3,000,000.

CRESCENT WORKS.—The new office building and laboratory under construction at the time of the writing of the last report has now been completed and is a great convenience for the use of our employees and experts.

PARK WORKS.—One of the most important improvements now under way in any of your plants is the one referred to in our last report, where a new open hearth building was contracted for in which to install four 50-ton open hearth furnaces and two 6-ton electric furnaces. It will probably be late in the spring of 1918 before these improvements are completed.

SINGER-NIMICK WORKS.—The construction referred to in our last report, covering the centralization of the boiler-units in this plant, is still unfinished and will hardly be completed before the coming year.

SYRACUSE CRUCIBLE STEEL CO.—This addition to the Crucible Steel Co.'s producing mills has been connected with one of our other plants in Syracuse and is now in successful operation, mills and furnaces recently having been installed in several of its buildings, in order to increase output.

SANDERSON WORKS.—The important addition to this plant, referred to in our 1916 report, has been finished and the plant is now running successfully, turning out the highest grades of drill-rods and drawn wire and steel.

PITTSBURGH CRUCIBLE STEEL CO., MIDLAND, PA.—The addition to the open hearth department of this plant has not yet been completed, but it is hoped that before Christmas its two large open hearth furnaces, which have been added, will be in successful operation. The heat treating building now under construction is expected to be finished and the machinery installed in it complete by the spring of 1918.

Midvale Earnings

Midvale Steel & Ordnance Co. has issued its report covering operations for the quarter ended Sept. 30, 1917. Earnings for the period, compared with the two preceding quarters of 1917, were as follows:

	Quarter Ended— Sept. 30, '17	June 30, '17	Mar. 31, '17
Net earnings	$18,045,082	$18,966,135	$15,859,738
Res. for Federal taxes..	7,817,964	8,132,591	6,189,027
Interest charges	805,685	816,521	814,456
Depreciation charges ..	1,382,148	1,758,233	1,800,864
Net profit	*$8,039,285	$8,258,790	$7,055,391

*Equivalent to $4.02 a share earned on $100,000,000 capital stock ($50 par value) in the three months period, or at annual rate of $16.08 a share.

Dividends

The Crucible Steel Co. of America, quarterly, 1¾ per cent on the preferred, payable Dec. 20.

The Dominion Steel Corporation, quarterly, 1¼ per cent, payable Jan. 1.

The Harbison Walker Refractories Co., quarterly, 1½ per cent on the common, payable Dec. 1.

The National Acme Co., quarterly, 75c. per share, payable Dec. 1.

The Niles-Bement-Pond Co., quarterly, 2 per cent on the common, payable Dec. 20, and 1½ per cent on the preferred, payable Nov. 20.

The Pratt & Whitney Co., quarterly, 1½ per cent on the preferred, payable Nov. 20.

The United States Cast Iron Pipe & Foundry Co., quarterly, 1¾ per cent on the preferred, payable Dec. 14.

The Scovill Mfg. Co., monthly, 5 per cent, payable Nov. 15.

The Pittsburgh Steel Co., quarterly, 1¾ per cent on the preferred, payable Dec. 1.

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
Nov.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
7	23.50	23.50	71.00	6.50	6.37½	7.87½	7.62½
8	23.50	23.50	70.00	6.50	6.37½	7.87½	7.62½
9	23.50	23.50	70.00	6.50	6.37½	7.75	7.50
10	23.50	23.50	....	6.50	6.37½	7.75	7.50
12	23.50	23.50	71.00	6.50	6.37½	7.87½	7.62½
13	23.50	23.50	73.00	6.50	6.37½	8.00	7.75

NEW YORK, Nov. 14, 1917.

The markets continue inactive. The copper situation remains indefinite, with prices nominal. Tin is scarce and has sold at the highest price in its history. Lead is dull, but firm. Spelter has a better tone and is firmer. Antimony is inactive and lower.

New York

Copper.—In the absence of any definite confirmation of sales to large buyers of either Lake or electrolytic copper for early delivery at the Government or any other price, we continue to quote the fixed price of 23.50c. as nominal. The position of the seller and buyer of small lots continues unsettled, but a little business is being done at above the fixed price. An interesting report is to the effect that refined copper is being delivered for early consumption at 23.50c. to consumers having Government work but not provided with copper by contract. As bearing on the general situation, copper exports to Oct. 1, this year, 370,843 tons, exceed the exports of 360,229 tons in all of 1914.

Tin.—Spot Straits tin sold yesterday at the highest price in its history. A 5-ton lot went at 73.50c. New York, and later a 5-ton lot was offered at 73c., which we quote as the market. Yesterday also the Government, being unable to buy 15 to 25 tons for its Washington Navy Yard needs, requisitioned what it desired from the 250 tons on an incoming steamer, the Mahopah, consigned to various dealers and already sold. No price settlement was announced. The present scarcity is due to the tightness of the permit situation limiting all shipments to stipulated consumers only. Banca and Chinese tin are also extremely scarce. Efforts of the Tin Committee to make some agreement at Washington have not so far relieved the situation, but a solution is announced. In general the market is quiet, buyers awaiting developments and abstaining from the market so far as possible. Arrivals up to Nov. 12 inclusive were 830 tons, with 4100 tons reported afloat. The London market yesterday was £274 per ton for spot Straits, an advance of £13 10s. in the week.

Lead.—The market has quieted down since the strength and activity displayed recently, with buying now in small volume. The leading producer again advanced its price on Wednesday, Nov. 7, from 6c. to 6.25c., New York, which it continues to quote. The outside market stands at 6.50c., New York, or 6.37½c., St. Louis, at which a few sales have been recorded. The situation is strong as a whole and has only one weak point. A few sellers who did not participate in the large market of the last few weeks are now reported as offering some metal at concessions. Most sellers are comfortably filled with orders.

Spelter.—The market has a little better tone this week and is firmer. Sales of small lots have been made from 7.50c. to 7.87½c., St. Louis, in the last week, but they have not been large. The lower prices have about disappeared and the market for prime Western for early delivery is quoted at 7.75c., St. Louis, or 8c., New York. The firmer tone is induced by the belief that Government purchasing on a considerable scale is near at hand. This will involve not only special grades, but also large amounts of prime Western for rods. Important meetings between the War Industries Board and the spelter producers are now being held. Price fixing is likely to be a result of these deliberations. If reports are true that the Government is ordering or has ordered 33,000,000 shells of 3-in. size it will involve 33,000,000 lb. of spelter for brass cases for these shells.

Antimony.—There is better demand and the market is lower. Chinese and Japanese grades are quoted at 13.75c. to 14c. per lb., New York, duty paid.

Aluminum.—The market is inactive with No. 1 virgin metal, 98 to 99 per cent pure, available at 36c. to 38c. per lb., New York.

Old Metals.—The market is practically unchanged. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	21.00 to 21.50
Brass, heavy	18.00 to 18.25
Brass, light	12.00 to 12.50
Heavy machine composition	24.00 to 24.75
No. 1 yellow rod brass turnings	15.00 to 16.00
No. 1 red brass or composition turnings	19.00 to 19.50
Lead, heavy	5.50
Lead, tea	4.25
Zinc	6.25

Chicago

Nov. 12.—Old lots of copper amounting to a considerable tonnage have changed hands, the buying, in most cases being necessitated by dire need, and the sellers, in many cases, being over-stocked manufacturers. In antimony, no price at all is obtainable, pending Government action having in view the assurance of its supply. Lead has been active and both the leading interest and the independent producers have advanced their quotations. Tin is quoted to-day at 71.50c., but has been higher, and with the soaring prices there has been considerable activity. Spelter is a trifle higher, but with almost nothing doing. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 71.50c.; small lots, 73.50c.; lead, 6.25c. to 6.50c.; spelter, 7.75c.; sheet zinc, 19c.; antimony, prices withdrawn. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 4.50c.; zinc, 5c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

Nov. 12.—In the non-ferrous metals market there has been improvement in some of the weaker items and an addition of strength to those which were strong at the last report. In less than carload lots the quotations to-day were: Lead, 7c.; spelter, 8.50c.; tin, 76c.; copper, nominal, 27.50c.; Asiatic antimony, 18c. In carload lots: Lead, 6.50c. to 6.75c.; spelter, 8c.

In the Joplin district there was continued weakness in zinc ore, though the top basis price was held at $72.50 per ton for 60 per cent metal, with a higher figure for premium ores. The average price, however, was considerably below this figure, and the second-grade ores, which brought $60 per ton the week before, were set back to $57.50 per ton. The average for the week for the district was $61 per ton. In calamine there was also weakness and the basis price for 40 per cent ore was $32 to $35 per ton, with the average for the week for the district at $34 per ton. Lead ore advanced and was sold $10 per ton higher than the week before, though the advance came rather late in the week. The average for the week for the district was $70 per ton. Inability to get cars to handle ore is having a bad effect on the situation and is holding down sales and shipments. Buyers are threatening to retire from the market unless the car situation is improved. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; lead, 5.50c.; tea lead, 5c.; zinc, 5c.; pewter, 25c.; tinfoil, 42c.

Pointing out that 71 per cent of the gas produced in West Virginia is transported to points outside the state to the disadvantage of West Virginia manufacturers, a resolution has been unanimously adopted by the Wheeling Council, calling upon the State Public Service Commission and other official bodies to take whatever action may be necessary to insure an adequate supply of fuel for West Virginia industries.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Some of these quotations are nominal, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c.; minimum carload 36,000 lb.; St. Paul 35.5c.; minimum carload 36,000 lb.; Denver 79c.; minimum carload 36,000 lb.; Omaha 47c.; minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c.; minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c.; minimum carload 40,000 lb. and 85c.; minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.85; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets.....$4.65 base
7-16 in. x 6 in. smaller and shorter rivets..45-10 per cent off list
Machine bolts h.p. nuts, ⅝ in. x 4 in.
Smaller and shorter, rolled threads...50-10-5 per cent off list
Cut threads.....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t nuts, ⅜ in. x 4 in.
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts, ⅜ in. x 5 in.
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads.....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts.....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq., blank.....2.50c. per lb. off list
Hot pressed nuts, hex., blank.....2.30c. per lb. off list
Hot pressed nuts, sq., tapped.....2.30c. per lb. off list
Hot pressed nuts, hex., tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.00c. per lb. off list
Semi-finished hex. nuts
⅝ in. and larger.....60-10-10 per cent off list
9-16 in. and smaller.....70-5 per cent off list
Stove bolts.....70-10 per cent off list
Stove bolts.....2½ per cent extra for bulk
Tire bolts.....50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods, and other rods of that character, $65; high carbon rods, made from open hearth steel, $80 to $85 and special high carbon tired steel rods with carbons running from 0.40 to 0.60, $90 to $100; above 0.60 carbon, $100 to $110. All these prices are f.o.b. mill, Pittsburgh.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I.C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh, announced Nov. 12, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	.34	3½ to 4½ in.	12½
2½ to 3¼ in.	.24	3 to 3⅛ in. plus	5
2¼ in.	.17½	2½ to 2⅝ in. plus	7½
1¾ to 2 in.	.13	2 to 2⅛ in. plus	22½
		1⅝ to 1⅞ in. plus	35

Standard Commercial Seamless—Cold Drawn or Hot Rolled	per net ton		per net ton
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅝ in.	270	2⅝ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer	Cents per lb.
Nos. 3 to 8	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

PITTSBURGH FAVORED

Such Is Opinion of Examiner in Regard to Railroad Rates—Revision Expected

WASHINGTON, Nov. 13.—In a report to the Interstate Commerce Commission on the complaint of the Pollak Steel Co., Cincinnati, against the Baltimore & Ohio and other railroads, Attorney Examiner Charles F. Gerry recommends a finding by the commission that the railroads in their rates on iron and steel articles from Cincinnati and Chicago to Atlantic ports unduly discriminate in favor of Pittsburgh and other steel producing points, the rates from which are made in relation to those from Pittsburgh to Boston, New York, and Philadelphia. He further recommends that the commission issue an alternative order requiring the railroads to either raise the rates from Pittsburgh, Youngstown, Cleveland, Lorain, Zanesville and Middletown, Ohio, or reduce the rates from Cincinnati and Chicago and points taking rates related to the charges from the points of origin mentioned to the destinations set forth.

This report follows the general line laid down by the commission in its report in the Eastern Export Iron and Steel Case, 43 I. C. C., 5. As a result of that decision, the export rates on steel were brought up to the level of the domestic. At the time the carriers, to enable them to take advantage of the commission's decision, undertook the revision of export rates on iron and steel, so that those from Cincinnati and Chicago bore a definite relation to those from Pittsburgh, Youngstown, Cleveland and other points taking specific cents per 100 pounds over the Pittsburgh rates.

While the roads were engaged in this revision, the commission allowed a big increase in class rates in Central Freight Association territory, the group lying between the Mississippi River on the west, the Buffalo-Pittsburgh line on the east, the Ohio River on the south and the north shore of Lake Erie on the north. Still later, it allowed an increase in class rates for the whole eastern territory, to be placed on top of the one in Central Freight Association. The higher rates went into effect on September 20 and earlier dates.

Examiner Gerry now recommends either bringing the Chicago and Cincinnati domestic rates down to the basis used in making such rates from Pittsburgh, or bringing the Pittsburgh rates up to the basis on which these from Chicago and Cincinnati are founded.

The Cincinnati and Chicago domestic rates are on the basis of the New York-Chicago percentage scale. In that scale the rates from Chicago to New York are 100 per cent. Cincinnati is an 87 per cent point, that is, it takes rates to New York, as a typical point, 87 per cent of those from Chicago. Pittsburgh is a 60 per cent point, but when the Lackawanna Steel Co. got into the market, it was given rates from Buffalo the same as the rate from Erie to Philadelphia. Then Pittsburgh steel interests insisted upon having the same rates as Buffalo. The result was a scale of iron and steel rates from Pittsburgh to the east that was only 57.5 per cent of the Chicago-New York rates. Thereupon the Ohio points other than Cincinnati, demanded and received concessions by arbitraries of two cents from the valleys and three cents from Cleveland, over Pittsburgh.

When the railroads asked permission to bring their export rates up to the level of the domestic, the Pollak company objected unless it was given export rates related to the export rates from Pittsburgh on the same percentage that the Pittsburgh rates were related to the New York-Chicago export rate. It won its contention.

Now the domestic fabric must be adjusted, if the commission follows Examiner Gerry's recommendation, as it is taken for granted it will. Inasmuch as the railroads are fighting, in other cases, to have the commodity rates on other articles brought up to the level of the New York-Chicago scale, it is taken for granted they will raise the Pittsburgh and related rates.

Shippers in Chicago, western Pennsylvania, Ohio and West Virginia intervened in the case, asking to have their rates adjusted. The complainants and interveners are largely manufacturers and fabricators of iron and steel products such as roofing and metal sheets, ingots, sheet bars, sheet iron, corrugated iron, wire and wire products, sheet steel and tin plate, wrought pipe, horse shoes, mule shoes, bridge and structural steel. The interveners are the Andrews Steel Co., Newport Rolling Mill Co., Globe Iron Roofing & Corrugating Co., Cincinnati Horse Shoe Mfg. Co., Edwards Mfg. Co., Cincinnati Chamber of Commerce, Cincinnati Merchants Exchange, Ironton-Ashland Manufacturers' Association, and Whitaker-Glessner Co.

Extras on Semi-Finished Materials

The following standard classification of extras on semi-finished steel has been promulgated by the subcommittee on steel distribution of the American Iron and Steel Institute, the extras to be added to the base price (per gross ton) of rerolling billets, slabs and sheet bars:

Extras for Carbon

Up to and including 0.25 per cent carbon, base.
0.26 to 0.60 per cent carbon, $1 per gross ton.
Over 0.60 per cent carbon, $2 per gross ton.
Where range of carbons is specified extra is to be based upon the mean of such carbons.

Extras for Size and Cutting

For cutting small billets, $0.50 per gross ton.
Slabs 16 sq. in. in area and larger, base.
On sheet bars and billets under 3⅞ in. for random lengths down to 15 ft., no extra is to be charged, but regular charge of 50c. per ton is to be made for such bars and billets cut to exact lengths.

Prices and extras apply only to material of standard specifications; customary extras for special phosphorus, manganese, silicon, sulphur, etc., to apply.

Plan Blast Furnace and Coke Plants

The St. Louis Coke & Chemical Co., a subsidiary of the American Coke & Chemical Co., Chicago, announced at St. Louis Nov. 8 its decision to build a plant at or near East St. Louis, Ill., to make metallurgical coke from Illinois coal by the Roberts by-product coke oven process. The first named company is incorporated with a capital stock of $15,000,000 in Illinois, with George T. Buckingham as president, and the parent company has been organized with Clement Studebaker, South Bend, Ind., president; George T. Buckingham, Chicago, vice-president; Scott Brown, secretary and treasurer; Arthur Roberts, chairman of the executive committee; together with George W. Niedringhaus, of the National Enameling & Stamping Co., W. G. Bierd, president of the Chicago & Alton Railroad and others on the board of directors. A number of sites have been placed under option and as soon as a definite selection has been made, a plant will be equipped, the first unit requiring about 12 to 15 months to build.

The plans of the company are said to include the building of blast furnaces for the delivery of hot metal to the iron and steel plants situated on the East side at St. Louis in suburban towns. As by-products, toluol, xyol, benzoin, solvent naptha as well as gas, tar and ammonia products, will be included in the output of the new coking plant. The blast furnace plans include three stacks of 500 tons each daily capacity. L. E. Fischer is to be engineer in charge.

The Tidewater Coal Exchange has been formally approved by the United States Fuel Administration and an order has been issued requiring all transshippers of coal at New York, Philadelphia, Baltimore and Hampton Roads to make shipments through this Exchange. The Exchange was organized some time ago and practically all shippers to these points have been handling and making shipments through it, a few shippers remaining outside, which interfered with the successful operation of the Exchange, in that 100 per cent efficiency could not be obtained unless all shippers were members.

Contracting for Millions of Shells

Some Orders Distributed and Others Will be Later—Canadian Plants Not to be Utilized if Work Can be Done in the United States

WASHINGTON, Nov. 13.—Arrangements have been completed with the assistance of the War Industries Board for the placing of contracts by the Ordnance Bureau of the War Department for approximately 6,500,000 6-in. shells. The placing of these contracts was a very difficult task inasmuch as it threatens to test the extreme capacity of American manufacturers. As a matter of fact, it is said, the contracts could not have been placed so quickly and so efficiently had it not been for the services of the War Industries Board and the co-operation of the American Iron and Steel Institute. The orders were distributed according to the advice of the Subcommittee on Production of the institute.

To make this number of shells, which correspond in size with the standard shell which is being used by the French on the western front, will require over 487,500 tons of steel. The problem first confronted by the Ordnance Bureau was to distribute the order for this steel. Naturally the order took priority over all others held on the books of the steel mills. Each mill was requested to supply the amount which it was capable of furnishing under normal conditions, but in distributing the proportions some consideration was given to the business the mill already had on hand. It is said that practically all the large steel mills of the country participated in the orders.

Contracts for Forgings.

The Ordnance Bureau within a very short time will be ready to distribute contracts among the forgers of the country to forge the metal for the shells. Orders for the forgings will be distributed in the same manner in which the orders for the steel itself have been distributed. Later the orders for the finished shells will be allotted among the machine manufacturers. In the placing of all these contracts, however, the Ordnance Bureau takes into consideration the amount of work and its nature that each plant has on hand.

The Government has heretofore placed contracts for 5,000,000 6-in. shells, in the manufacture of which more than 375,000 tons of steel are being used. In placing the additional contracts the Ordnance Department was advised by the War Industries Board to take into consideration the fact that the mills and plants already had some contracts and urged that the distribution of the new orders be made in a manner to supplement and not to crowd the prior contracts.

Keep Details Secret.

The 6-in. shells are the type which the Government has decided to hurry out first. They are not exactly 6-in. calibers, but approximate that size, being close equivalents in millimeters calibrated to the French standard. The exact identity is not desired to be proclaimed by the officials because much publicity regarding ordnance work and contracts is frowned upon by the Administration. As a matter of fact, the military authorities have done all in their power to keep secret the fact that contracts were going out and positively refuse to permit to become known the names of the firms engaged in the work. It is sufficient, they say, to know that all the firms capable of doing the work will be drafted into taking contracts. It is no longer a matter of the firm seeking the contract, but of the contract seeking the firm.

Following the orders for the 6-in. shells which have now gone out, the department intends to take up immediately the question of letting contracts for 3-in. shells, of which it is understood about 33,000,000 will be ordered. In the production of these shells at least 247,500 tons of steel will be used. Negotiations for the placing of these orders are now under way. Following the distribution of this work the Ordnance Bureau, it is said, will proceed to make up schedules for larger shells, 8 to 12 in. in diameter. Probably more than 390,000 tons of steel in addition will be needed for these.

A Gigantic Task

This gives but a general idea of the enormous amount of the work which is being distributed among American plants. The task of distributing the orders for the steel itself was a monumental one, inasmuch as it was necessary to place the business equably and then to file priority orders against many of the plants. In most cases, it is understood, the steel men voluntarily gave priority to the ordnance contracts.

Practically all of the machine manufacturers of the country as well as the forgers will participate in the work. The report has already been circulated, though without the confirmation of the Department, that the New York Air Brake Co. will make about 1,000,000 of the 6-in. shells and that the American Car & Foundry Co. will make another million. Many of the automobile plants are seeking contracts to make shells and will, before the year is out, replace a part of their plant facilities with equipment for this ordnance work. The Priorities Committee has already taken action which is calculated to curtail the production of passenger automobiles in the United States, and the plants will be used to make shells and other ordnance supplies.

Work for the Machinery Plants

How rapidly the machine plants can be changed over, or even prevailed upon to make the shells and ordnance supplies needed, is a problem. It is believed that some of them will hesitate, and therefore it is being urged upon the Department to make use of the established munition plants in Canada. The Canadian plants have been making ordnance supplies for England, but England is now nearly equipped to make all of her own munitions. The Canadian plants have developed to considerable proportions, and now that the English contracts are being withdrawn, they are ready to take on contracts for the United States. One report states that the Imperial Munitions Board of Canada has been negotiating with the United States for contracts to make between six and seven and a half million shells for delivery during the first seven months of 1918. The United States, however, will not make use of this offer unless it is found impossible to locate sufficient plants in the United States to undertake the work.

As a matter of fact, many munition plants which have been developed in the United States on foreign orders since the outbreak of the war in Europe are now prepared to take on contracts for the United States, and in that regard are in a similar position to that of the Canadians. The domestic plants will be given work first, and for the present, it is understood, there will be no necessity of calling upon outsiders for assistance in making the shells.

W. L. C.

Large Heroult Electric Steel Furnaces Operating

The largest electric steel plant in the world is now in operation at the South Works of the Illinois Steel Co., South Chicago, Ill. One of the two 25-ton Heroult electric furnaces was started on Friday, Nov. 9, with the other one following at once. It has been decided to install another 25-ton in this plant immediately. The two 15-ton furnaces there have been operating for some time. The last one erected made steel for the first time in June, 1916. When all are operating at this plant, there will be three 25-ton and two 15-ton Heroult furnaces.

PERSONAL

Major Benedict Crowell, Cleveland, who was appointed Assistant Secretary of War last week, is well known in the iron ore trade, with which he has been associated for several years in a professional capacity as chemist. As a member of the firm of Crowell & Murray, chemists, Cleveland, he has done a great deal of ore analysis work for firms mining and selling Lake Superior ores. He was born in Cleveland in 1869 and was graduated from Yale in 1891. Returning to Cleveland on the completion of his college course, he became chemist for the Otis Steel Co. in that city. He left that company to engage in business for himself as a chemist and later also took up mining engineering in connection with his other work. He has also for some time been an important figure in the building contracting field in Cleveland as president of the Crowell-Lundoff-Little Co., contractor. With Mr. Murray he is joint author of the well-known volume, "The Iron Ores of Lake Superior." The new Assistant Secretary, who is an officer of the Engineer Reserve Corps, will take over this branch of war preparation and, in addition to relieving Secretary Baker of much of the detail work that has arisen in connection with the great task of providing arms and ammunition for the United States military forces, will co-operate with General Crozier, chief of the Ordnance Bureau, in the work of concentrating American manufacturing industries upon production of heavy ordnance and field artillery of all kinds. Major Crowell will also co-operate with the Quartermaster's Department in systematizing the agencies, Governmental and private, through which the army in field and in camp is being supplied. Immediately after the formation of the National Council of Defense he went to Washington, and became associated with the work of the General Munitions Board, especially in connection with steel production.

Photo by Edmondson

MAJOR BENEDICT CROWELL,
Assistant Secretary of War

J. Leonard Replogle, director of steel supply for the United States and allied governments, was called from Washington in the past week to Johnstown, Pa., by the death of his father, Rev. R. Z. Replogle.

W. Karl Hilbrich assumed the position as purchasing agent of the Erie Malleable Iron Co., Erie, Pa., Nov. 1.

C. R. Murphy, Green Bay, Wis., has been elected secretary of the Lawson Aircraft Corporation, Green Bay, which is manufacturing airplanes for the Government. Mr. Murphy succeeds C. I. Smith, who resigned because of the pressure of other interests.

Richard Garlick, treasurer of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has returned to his duties after an extended vacation, spent mostly at watering places in the East. Mr. Garlick's health has been greatly benefited by his long rest.

Robert J. Mullaly has been named assistant superintendent of the McDonald, Ohio, bar mill plant of the Carnegie Steel Co., under construction. W. U. Dennison is superintendent of the McDonald plant.

Alvin Whitehead has joined the office force of Clarke & Harrison, dealers in machinery and equipment, 149 Broadway, New York. For the past two years and a half he was connected with the machinery department of Gaston, Williams & Wigmore, Inc.

Jay C. McLauchlan, of Pickands, Mather & Co., Cleveland, has been appointed assistant to J. Leonard Replogle, who has charge of iron and steel matters for the War Industries Board. Mr. McLauchlan will give particular attention to the supply of pig iron.

W. F. Morris has been made general traffic manager of the Crucible Steel Co. of America, Pittsburgh, a newly created position. He will have entire charge of traffic matters of the company, also of the Pittsburgh Crucible Steel Co., a subsidiary, and other interests.

Carl Barth, consulting engineer, Philadelphia, is to address the Philadelphia section of the American Society of Mechanical Engineers on Feb. 26, 1918, on "Supplement to Taylor's 'Art of Cutting Metals'." Recent developments in material specifications is to be discussed on March 26 by Dr. S. W. Stratton, director U. S. Bureau of Standards and developments in the treating of corrosion problems on April 23 by Dr. Allerton S. Cushman, major Ordnance Department, U. S. R.

C. B. Young has been appointed manager of the Western Gas Construction Co., Fort Wayne, Ind., builder of water, coal and oil gas apparatus. On account of ill health, O. N. Guldlin, founder of the company, will retire from the active management, but will be retained in a consulting capacity. Thomas W. Stone will continue with the company as chief engineer.

Henry S. Sherman, vice-president and treasurer of the Standard Car Wheel Co., and D. S. Blossom, vice-president of the William Bingham Co., Cleveland, have volunteered to serve as executives with the American Red Cross in France, and will leave shortly for that country, where they expect to remain until the close of the war.

E. H. Whitlock, consulting engineer, Cleveland, and director of the Wellman-Seaver-Morgan Co., that city, who has been in the Government service several months, is now in the Ordnance Department at Washington with the rank of major.

J. E. Thropp, Jr., has been appointed superintendent of the blast furnaces of the American Rolling Mill Co. at Columbus, Ohio.

Warren S. Blauvelt, Steere Engineering Co., Detroit, has been appointed to act on the staff of the United States Fuel Administration on all matters pertaining to coke.

H. Norman Brooke & F. H. Brooke, Sheffield, England, have acquired the exclusive right to manufacture and sell Maccallum Metal-Kase brick in Great Britain. The firm is a large manufacturer of silica and magnesite brick at its Cleveland Works (Cleveland Magnesite & Refractory Co., England), and is associated with Benj. F. Talbot, managing director of the Cargo Fleet Iron Works and inventor of the Talbot process for making steel.

Dudley R. Kennedy, formerly assistant to J. A. Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has resigned to accept a responsible position with the American International Shipbuilding Corporation of Philadelphia, a subsidiary of the American International Corporation. Mr. Kennedy will have charge of the industrial relations work

of the Philadelphia company. For some years he was in charge of the claims department of the Youngstown Sheet & Tube Co., and resigned to assume charge of the industrial relations work of the B. F. Goodrich Co. at Akron, where he remained several years. Nine months ago he returned to the Youngstown Sheet & Tube Co., with the title of assistant to the president, acting as a representative of President James A. Campbell at the plant and supervising the company's extensive housing projects.

James H. McKee, superintendent forge department, Pittsburgh Screw & Bolt Co., has been called to Washington by the Government to give his services in the gas masks investigation.

H. E. Lewis, formerly assistant to the president, Bethlehem Steel Co., has been elected a vice-president of the company. H. S. Snyder, vice-president Bethlehem Steel Co. and its steel and shipbuilding subsidiaries, has been placed in charge of the finances of the corporation and all subsidiaries. E. B. Hill, formerly treasurer Fore River Shipbuilding Corporation, Quincy, Mass., was elected treasurer.

Roy B. Woolley, formerly sales and advertising manager of the Standard Electric Stove Co., Toledo, Ohio, and late of the American ambulance field service at the Verdun front in France, has served his enlistment and has returned to the United States. He is now with the Society for Electrical Development, New York, as an executive in its advertising department.

Charles F. Hall, structural and mechanical engineer, has joined the staff of the Booth-Hall Co., 565 West Washington Street, Chicago, manufacturer of electric steel furnaces, in the capacity of production manager. To accept this position Mr. Hall has left Armour & Co., Chicago, where he held the position of structural engineer, and was in full charge of engineering work in the construction department.

A. H. Dillon, for about 12 years in the sales department of the Youngstown Sheet & Tube Co., and for six or seven years assistant sales manager, has tendered his resignation. He is to engage in a general brokerage business in steel, machinery and similar products, maintaining offices in Youngstown, Pittsburgh and New York.

Clarence M. Woolley, for many years president of the American Radiator Co., has been appointed member of the War Trades Board by President Wilson at the request of Secretary Redfield. He is to administer supervision over imports.

Charles H. Carter of the Philadelphia office of the Midvale Steel & Ordnance Co. is now representing the company in Washington, where an office has been established.

W. C. Webster, who has been secretary and general manager and director of the Nichols Copper Co., 25 Broad Street, New York, for several years, has resigned. He expects to take a rest before assuming further duties.

With a view to increasing the efficiency of the transportation systems of the country and especially for the purpose of reducing car shortage the Council of National Defense has issued a bulletin addressed to the several State councils of defense urging shippers in all lines to conform to a code of rules drafted by the American Railway Association for the use of freight cars. The bulletin says there is still a shortage of freight cars and the demand will increase with the movement of fall crops, including grain and cotton, unless every shipper and consignee co-operates to relieve the strain.

The Hanging Rock Iron Co., Hanging Rock, Ohio, has placed orders for a movable car dumper and an ore handling bridge. The former will be erected by the Wellman-Seaver-Morgan Co., Cleveland, and the latter by the Brown Hoisting Machinery Co., Cleveland.

PLATES FOR JAPAN

Shipment of Product Under Contract Will Probably Be Permitted

WASHINGTON, Nov. 13.—A recommendation has gone to the War Trade Board to grant permits to the Japanese to export those ship plates which have been made in the United States under contracts with the American mills existing at the time the President imposed an embargo upon such steel. The board will announce its decision in this regard within the next few days, probably before the end of the current week.

The recommendation to grant these permits originated with the Shipping Board. This board negotiated with Count Ishii and his colleagues when the Japanese mission was in the United States recently for some of the Japanese ships to be used in the Atlantic trade. Japan has consented upon condition that Japanese shipbuilders be allowed to ship plates which have been made in the United States under contract but which have been tied up in American warehouses because of the embargo. The agreement contemplates the sending of at least 12 Japanese vessels to the Atlantic to aid in relieving the heavy freight congestion on shipments to Europe.

When the President placed his embargo upon the exportation of ship plates the American mills had upon their books many contracts with the Japanese. It has been learned from some of the Washington representatives of the steel producers that the mills filled the then existing contracts but refused to take on any new orders from the Japanese. Since then the War Industries Board has seen to it that the American mills have been filled with contracts for account of our own Government. The Shipping Board has itself taken on contracts for ship plates nearly equal to the full capacity of the mills.

The plates made for Japanese account were stored in American warehouses because of the inability of the owners to obtain export permits. A large percentage of these plates, it is said, has been shipped to the Pacific ports awaiting the raising of the embargo. It is learned upon authority that the War Trade Board has knowledge of only a certain proportion of the Japanese plates being shipped to Pacific ports, although, it is said, all of these plates are now stored in American warehouses.

The Japanese found it difficult to ship to the Pacific ports because the railroads, acting upon suggestions of the Government, refused to accept on export bills of lading ship plates which were embargoed. The Japanese, it is said, have sought to overcome this by shipping their plates to the Pacific coast upon domestic bills of lading, hoping thus to save time when the United States finally consented to lift the embargo. Inasmuch as the strict embargo of plates was issued by the President on Aug. 2 last, there has been sufficient time for the Japanese to secure delivery of most of the plates for which they had already contracted and to move these to the ports upon domestic bills.

W. L. C.

Only Two Bids

Only two American manufacturers submitted bids for 336,000 5-in. projectiles, representing a contract of about $4,000,000. One was the Bethlehem Steel Co. and the other the Ingersoll-Rand Co.

The officials of the War Industries Board announce that before any change is made in the order issued by the Priority Committee in regard to the delivery of chrome alloy steel to the manufacturers of passenger automobiles the board will await the recommendations of a special committee representing the automobile industry which has just been organized to devise a method of applying the proposed embargo with the least possible injury to the manufacturers.

Further Prices in the Fixed Price Program

Maximum Figures Trade is Asked to Adopt— Boiler Tubes, Bolts and Nuts, Bar Iron, Wire Products, Sheets and Warehouse Business

The following statement was made late on Nov. 13 by E. H. Gary, chairman of the Committee on Steel and Steel Products of the American Iron and Steel Institute:

In announcing under date of Nov. 5, 1917, an agreement made by the War Industries Board with the principal steel industries of the United States, fixing maximum prices on certain steel articles, namely, sheets, pipe, cold rolled steel, scrap, wire and tin plate, the Board, with the approval of the President, made the following statement:

In connection with the above, the iron and steel manufacturers have agreed promptly to adjust the maximum prices of all iron and steel products other than those on which prices have been agreed upon. It is expected that this will be done promptly and consistently in line with the basic, intermediate and finished products. for which definite maximum prices have been established.

The General Committee on Steel and Steel Products of the American Iron and Steel Institute has received from a sub-committee a report based on information received from representative manufacturers of various other lines of steel and steel products, and from such report and other data available, the General Committee has reached a conclusion as to fair and reasonable prices for such products in line with the basic, intermediate and finished products for which definite maximum prices have been established and now recommends to the industry that the prices below stated be adopted as maximum prices, to take effect immediately, to apply to the requirements of the United States Government, to the war requirements of the Allies and for domestic consumption within the United States.

The committee expresses the hope that there will be no hesitancy in accepting this recommendation.

Iron Bars

Base sizes, per 100 lb.....$3.50
Usual and customary extras for size, quantity, etc., and established custom as regards delivery point to govern.

Wire Products

Wire nails, base, per 100 lb., f.o.b. Pittsburgh.....$3.50
Painted barb wire, base, per 100 lb., f.o.b. Pittsburgh... 3.65
Usual trade differentials as to sizes and quantity to govern.

Boat Spikes

Base sizes, per 100 lb., f.o.b. Pittsburgh.....$5.25
Usual trade differentials as to sizes and quantity to govern.

Automobile Sheet Prices—Based on No. 22 Gage

Other gages at usual differentials.

	Primes only. Per 100 lb.	Primes when seconds up to 15 per cent are taken. Per 100 lb.	Seconds arising.
Automobile body stock	$5.95	$5.85	*See Note
Automobile body stock, deep stamping	6.20	6.10	
Automobile body stock, extra deep stamping	6.45	6.35	
Hood, flat fender, door and apron, or splash guard stock	6.05	5.95	
Crown fender, cowl and radiator casing, deep stamping	6.30	6.20	
Crown fender, cowl and radiator casing, extra deep stamping	6.55	6.45	

Automobile Sheet Extras for Extreme Widths:
Nos. 17 and 18 over 36 in. to 44 in., 10c. per 100 lb.
Nos. 19 to 21 over 36 in. to 44 in., 30c. per 100 lb.
Nos. 22 to 24 over 36 in. to 40 in., 40c. per 100 lb.
Nos. 22 to 24 over 40 in. to 44 in., 80c. per 100 lb.
Black sheet extras to apply on narrow widths.
Oiling, 10c. per 100 lb.
Patent leveling, 25c. per 100 lb.
Resquaring, 5 per cent of gage price after quality, finish and size extras have been added.

*10 per cent less than the invoice Pittsburgh price for corresponding primes.

Electrical Sheets

Guaranteed as to electrical efficiency. Manufactured under various trade names and guaranteed to meet the established standard of the grades under the trade names given below.

Armature grade, base sizes, No. 28 gage.....$6.00
U. S. electric, base sizes, No. 28 gage..... 6.50
Dynamo, base sizes, No. 28 gage..... 8.00
Apollo special, base sizes, No. 28 gage..... 8.50
Black sheet extras to apply to special sizes.

Forging Steel

Base price per gross ton, f.o.b. Pittsburgh $60
Subject to the following extras:

Large size forging bloom extras.	12,000 lb. and under each.	Over 12,000 lb. each.
Up to but not including 10 x 10 in.	Base	$7
10 x 10 in. up to but not including 16 x 16 in.	$2	9
16 x 16 in. up to but not including 20 x 20 in.	4	11
20 x 20 in. up to and including 24 x 24 in.	6	13

For slabs, use the above extras for equivalent sectional area; and for slabs of greater equivalent area than 24 x 24 in., use the above extras for 24 x 24 in. blooms.

Usual carbon differentials and other extras as provided in the billet schedule to be added in addition to the above extras for forging quality, as follows:

	Extra for carbon
Up to and including 0.25 per cent carbon	Base
0.26 to 0.60 per cent carbon	$1 per ton extra
Over 0.60 per cent carbon	2 per ton extra

All the above extras will apply to all material sold for forging purposes. They also apply to either basic open hearth or Bessemer steel.

For forging into car axles only, blooms under 10 x 10 in. will carry an extra of $5 per ton over base price of re-rolling billets(i. e., $47.50 per gross ton), to which will be added usual extras for carbon, as above.

Lapweld Steel Boiler Tubes

3½ to 4½ in. tubes, 34 per cent off list.
2½ to 3¼ in. tubes, 24 per cent off list.
2¼ in. tubes, 17½ per cent off list.
1¾ to 2 in. tubes, 13 per cent off list.
Above prices for carload lots f.o.b. Pittsburgh.

Charcoal Iron Boiler Tubes

3½ to 4½ in. tubes, 12½ per cent off list.
3 to 3¼ in. tubes, list plus 5 per cent.
2½ to 2¾ in. tubes, list plus 7½ per cent.
2 to 2¼ in. tubes, list plus 22½ per cent.
1¾ to 1⅞ in. tubes, list plus 35 per cent.
Above prices for carload lots f.o.b. Pittsburgh.

Standard Commercial Seamless Boiler Tubes

Cold Drawn or Hot Rolled.

1 in. .....$340 per net ton
1¼ in. ..... 280 per net ton
1⅜ in. .....270 per net ton
1½ in. ..... 220 per net nto
1¾ in. ..... 220 per net ton
2 to 2½ in. ..... 190 per net ton
2¾ to 3¾ in. ..... 180 per net ton
4 in. ..... 200 per net ton
4½ to 5 in. ..... 220 per net ton

Above prices for carload lots f.o.b. Pittsburgh.

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Special Skelp for Boiler Tubes, Etc.

Base sizes, f.o.b. Pittsburgh, per 100 lb.....$3.40
Other sizes, f.o.b. Pittsburgh, per 100 lb..... 3.55

Round Billets for Seamless Steel Tubes

Base sizes, f.o.b. Pittsburgh, per 100 lb.....$3.25

Bolts, Nuts and Rivets

Large rivets .....$4.65 Base
7/16 x 6 in. smaller and shorter rivets..45-10 per cent off list
Machine bolts, h.p. nuts, ⅜ x 4 in.:
Smaller and shorter, rolled threads....50-10-5 per cent off list
Cut threads .....50-5 per cent off list
Larger and longer sizes .....40-10 per cent off list
Machine bolts, c.p.c. & t. nuts, ⅜ x 4 in.:
Smaller and shorter .....40-10 per cent off list
Larger and longer .....35-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads .....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts .....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, square blank.....2.50c. per lb. off list
Hot pressed nuts, hexagon, blank.....2.30c. per lb. off list
Hot pressed nuts, square, tapped.....2.30c. per lb. off list
Hot pressed nuts, hexagon, tapped.....2.10c. per lb. off list
C. p. c. & t. square and hexagon nuts, blank,
2.25c. per lb. off list
C. p. c. & t. square and hexagon nuts, tapped,
2.00c. per lb. off list
Semi-finished hexagon nuts:
⅝ in. and larger .....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts .....70-10 per cent off list
Stove bolts .....2½ per cent extra for bulk
Tire bolts .....50-10-5 per cent off list

The above discounts are from present lists now in effect.
All prices carry standard extras.

Warehouse Trade

Prices From Stock on Heavy Iron and Steel Products.

The following differentials to apply on the official maximum mill prices f.o.b. Pittsburgh, plus carload rate of freight from Pittsburgh to warehouse point:

Bars, structurals, plates, blue annealed, No. 16 and heavier, billets, $1 per 100 lb.

One pass cold rolled sheets, No. 18 and lighter; galvanized sheets, $1.25 per 100 lb.

Cold rolled shafting, 25 points, which is $1.25 per 100 lb. on base sizes.

In addition to the foregoing, maximum prices were recommended for standard commercial wire rope. These are obtainable in printed form in a leaflet of four pages. Prices cover various grades and six geographical groups, and give discounts for the consumer, dealer and agents and United States Government.

Differentials on tin plate and sheets, while substantially ready for publication, are not yet available.

Pittsburgh Foundrymen's Association

The monthly meeting of the Pittsburgh Foundrymen's Association will be held in that city in the Fort Pitt Hotel on Monday evening, Nov. 19. Action will be taken on the death of Frank H. Zimmers, who served the association as its secretary since its organization more than 21 years ago. B. D. Fuller of the Westinghouse Electric & Mfg. Co. of Cleveland, elected president of the American Foundrymen's Association at its recent Boston meeting, will be the speaker. Bayard Phillips of Wm. J. Brant has been appointed acting secretary of the association.

The Government is preparing to take comprehensive and drastic action for the apprehension and punishment of all persons engaged in plots to destroy factories, bridges, etc., with the use of explosives. Authority for the prosecution of a vigorous crusade against this class of offenders is found in a war measure passed by the last Congress which is now being put into effect by the Bureau of Mines which is charged with its enforcement. The law also gives the bureau full jurisdiction over the manufacture and distribution of explosives for all purposes and Francis S. Peabody, of Chicago, a well-known coal operator, familiar with the use of explosives, has been appointed as assistant to the Director of the Bureau of Mines.

Regulation of Exports of Tin Plate

WASHINGTON, Nov. 13.—The War Trade Board upon the recommendation of its bureau of imports and of the committee on the conservation of tin plate has made two additional rulings affecting the exportation of tin plate, which are set forth below in paragraphs (3) and (4), respectively, in the following list of such rulings, which is complete to date, and includes in paragraphs (1) and (2) the rulings promulgated on Oct. 24, 1917:

(1) That no licenses will be granted for the exportation of tin plate for use for any other purpose than as food containers, except on satisfactory evidence that the plate will be used in such a way as to contribute to the military needs of the nations at war with Germany and her allies.

(2) That as to application for license to export tin plate to be used as food containers, preference will be given to those cases in which satisfactory evidence is presented that the food to be packed will be for the use of the nations at war with Germany and her allies.

(3) That no licenses will be granted for the exportation of articles (other than tin plate) containing tin, except on satisfactory evidence that the goods will be used in such a way as to contribute to the military and other vital needs of the nations at war with Germany and her allies. Preference will be given to those cases in which satisfactory evidence is presented that the goods will be used in such a way as to contribute to the production or transportation of foodstuffs for the use of the nations at war with Germany and her allies.

(4) That no licenses for the exportation of tin plate will be granted, except to the manufacturers of the plate or to others who, either at the time of making application or before shipment out of the country, present satisfactory evidence that they have purchased the plate from a manufacturer on firm order from a purchaser abroad. This rule applies to pending as well as to future applications.

Carbon Steel Co. Affairs

The annual meeting of stockholders of the Carbon Steel Co. was held in its general offices, Pittsburgh, on Monday, Nov. 12. About 44,000 shares out of a total of 50,000 were represented at the meeting, either in person or by proxy. Because there had been controversy recently in regard to payment of bonuses to officers of the company, it was expected that the meeting might result in a contest for control, but this did not develop, with the exception that several new directors were elected. The following board of directors was unanimously elected: Charles McKnight, Raymond S. Baldwin, Walter H. Baker, H. T. Pierpont, W. D. Uptegraff, John Worthington and Woodward Babcock. A committee was appointed to fix the salary of the president and approve the payment of bonuses to other officials. A vote of confidence in and thanks to the management of the company was unanimously adopted. At a meeting of the new directors held after the general meeting of stockholders all former officials were re-elected as follows: Charles McKnight, president; D. R. Wilson, vice-president and treasurer; C. F. Blue, Jr., vice-president and general sales agent, and W. W. Noble, secretary. On Thursday, Nov. 15, the company paid a regular quarterly dividend of 1½ per cent and an extra of 2½ per cent on the common stock, declared some time ago.

Estimated Tin Plate Production

The Tin Plate Conservation Committee estimates for 1918 that the hot mill production will be 38,700,000 base boxes, and of coke tin plate 36,450,000 base boxes. During the first eight months of 1917 shipments for food containers for domestic use were 12,750,350 boxes of tin plate, and to Canada for the same purpose 587,372 boxes. Some idea of the enormous output of tin plate can be gathered from the fact that total shipments from the mills for the first eight months of this year, foreign and domestic, totaled 22,843,799 boxes. In addition to this, there were orders placed amounting to 15,619,760 boxes.

Buys More Land

The Solvay Process Co., Detroit, has purchased 1300 ft. of waterfront property on Zug Island, near Detroit, at $500,000. A large expansion of the plant is said to be contemplated.

MOBILIZATION OF LABOR

Lessons to Be Obtained from the Experience of Great Britain

A conference of employers of metal working plants and those building machinery, engines, boilers, motor trucks, airplanes and ships and railroad equipment and supplies was held at the headquarters of the Merchants' Association, Woolworth Building, New York, Nov. 13, to learn the experience of Great Britain in labor matters through a special mission of the British Ministry of Munitions. This mission, which has been touring the largest industrial cities of the country, is composed of Sir Stephenson Kent, member of the Council of the Ministry and director general of the labor supply department; H. W. Garrod, deputy assistant secretary of labor regulation department; G. H. Baillie, chief technical dilution officer of the labor supply department, and Capt. Cyril Asquith, director of the artificers' allocation of the labor supply department.

Sir Stephenson Kent reviewed briefly the so-called Treasury agreement between employers and employees, fixed in the munitions of war act, by which profits are limited and wage rates fixed. He then described briefly the workings of the law, in substance as follows:

To take care of the increased cost of living, an investigation is made every four months and the extra pay awarded is made up to the employer by the Government, so that the extra represents merely the increased requirement growing out of living cost and due to the special conditions. In the matter of the agreement, the workmen waive all regular practices such as control of output and the like and in return the pledge was made to restore the pre-war conditions, a very difficult proposal, the speaker mentioned parenthetically. The maximum penalty to which anyone is liable for attempting, as by inciting to strike, to interfere with the war needs, is penal servitude for life.

How Man Power Is Conserved

Mr. Kent emphasized especially the need of conserving man power with just as thorough an organization at home as at the front, if we are to win the war. He intimated that Great Britain has not yet arrived at the maximum expenditure of munitions. No non-essential industry, broadly speaking, exists which uses material or men required for the manufacture of war articles. To meet the enticement or auctioneering of labor between industries, there are two regulations of the defense of the realm act; one of these provides that any employer who has attempted to entice workmen is liable to prosecution with a severe penalty, and the other is that the Minister of Munitions may lay an embargo on a firm which is not making the full satisfactory employment of skilled men, for example.

Meeting Skilled Labor Scarcity

Mr. Baillie told of the two schemes for meeting the scarcity of skilled labor, one by the dilution with unskilled labor and the other by the substitution of women. The unskilled men are put on the relatively easy jobs and promoted as may be possible. He mentioned as an example that in a steel works in Wales, there were no operatives for new furnaces and there was no available supply of men. Accordingly the works employed 67 women, but these were not put on the furnaces, but replaced laborers, such as those used in loading and unloading jobs, handling bricks, breaking limestone and the like and the unskilled men were then put on simpler jobs in connection with the furnaces and gradually developed so that the new furnaces could be manned. Skilled workers in the non-essential trades were also utilized. Watch makers were put at manufacturing gages; plumbers were instructed in lead burning for explosive manufacture; carpenters were employed in shipyards and textile mill mechanics were put at doing the final work on munitions.

In the matter of substitution, he told how the women had been trained so that some were equal to making snap gages in the tool room, the women hardening and grinding the work to 0.005 in. and a skilled man putting on the finishing touches. In introducing women, it was agreed that they should get the same day rate as skilled workmen and the same piece work rate, when they substituted for such workers, but on semi-skilled or unskilled work a minimum wage was established about two-thirds of the wage of unskilled male labor.

1,000,000 Women Now Engaged on Munitions

The women as a class who went into munitions work, he said, averaged somewhat above those who had been regularly employed in factories previous to the war, such as those in textile mills. They have done far more than expected and over 1,000,000 women are now engaged in munition work. In a 5-in. shell plant only 6 per cent of the hands are men and in a 6-in. shell plant there is one skilled man to 50 women, and this is one of the best plants measured in terms of output. About 80 per cent of the employees in shell and fuse shops are women. Screw gages are made entirely by women. Of a plant making explosives, and employing 15,000, 11,000 are women. In a trinitrotoluol plant 80 per cent of the employees are women and in a picric acid plant about 40 per cent. In plants for filling shells, fuses and gaines the percentage is 90. The percentage in shell plants ranges from 90 per cent downward, the smaller number naturally being in the plants making the larger shells.

Training Schools for Women

Training schools have been equipped, one group comprising schools attached to the technical colleges and the other accommodated in factories which have been taken over for instruction purposes and which do actual munition work. With specialized training, operatives are produced in six to eight weeks time. The women are trained for specific jobs for which help is asked. Some makers of machines arrange to send to the purchaser one or two women operatives with the machines sold.

Mr. Baillie emphasized particularly the change of attitude toward the employment of women shown by manufacturers. There is no hesitation now, but instead a preference compared with that shown toward the old and army-unfit men now available. The shortage of labor came suddenly to England and he suggested that in the United States we are no better off in respect to skilled workmen and in a few months we will experience the same sudden shortage.

It was brought out in the discussion that the women obtained were largely those not previously in industry, such as shop girls, domestics and the like. The minimum ages for women are 18 and 16 years; best results seem to lie with the ages of 25 to 27 and while there is no upper limit, none over 35 years are taken into the training schools.

Accidents have decreased with the employment of workmen, though some of them are even operating overhead cranes. Women are employed in shipbuilding yards, punching light plates, and doing hydraulic riveting, but more on ships of war than on merchant ships. They have also done the intricate electric wiring work of the man-of-war.

Hours of Labor

The hours of labor are exactly those existing before the war. They vary from 52 to 54 hr. per week, with one and one-quarter time for the first two hours and one and a half time for more than two hours overtime. The only legislation in this respect passed puts the maximum for workmen at 60 hr. per week. In the early period of the war when there was such a tremendous need for munitions, men sometimes worked 100 hr. per week over long periods, four to six months, indeed, but by that time output began to drop rapidly. Now there is practically a stop to Sunday work. The average overtime amounts to four to five hours. Generally there are now only two shifts in most plants, but in explosive manufacture three shifts.

Entertained by New York Engineers

The special mission was given a luncheon on Nov. 13 by the Editorial Conference of the New York business journals and in the evening a dinner was tendered by

the United Engineering Society at Delmonico's. The formal program was opened by Charles F. Rand, president United Engineering Society, Col. J. J. Carty, American Telephone & Telegraph Co., presided as toastmaster, and Gano Dunn spoke for the assembled engineers.

Sir Stephenson Kent emphasized that the present is no war of armies but a clash of nations and indeed a clash of industries. Talking in the strain which he followed in the morning's meeting, reviewed in the foregoing, he explained that there had been no strike for increase of pay since the agreement under the munitions of war act, which incidentally covers war bonuses to compensate for the increased cost of living. He also remarked that no one had been sent to penal servitude for life, the penalty for instituting a strike calculated to interfere with the productio nof war materials. There has been no trouble on the front through want of a continuity of supply. No automobiles had been manufactured for private users in over 18 months. No building construction can be entered upon without a license where the cost is $2,500 or more.

He described briefly the war munitions volunteer movement under which 200,000 skilled men, the total so far, leave themselves at the disposal of the Government so they may be shifted to different kinds of work and to different plants. He felt confident that as a result of the Italian situation undoubtedly a large number of these volunteers have been called to the intensive production of guns for Italy.

Japan's Large Share in Steel Plate Exports

Steel plate exports in 1917 have been large and Japan's share has been very considerable. The following table gives Government figures in gross tons:

	Total Plate Exports	Plates and Sheets to Japan
First quarter, 1917	106,737	52,789
Second quarter, 1917	162,657	94,208
Third quarter, 1917	128,556	.....*
July	36,268	18,902†
August	49,801	28,591†
September	42,487	.....*
Total to Oct. 1, 1917	397,950	194,490
Fiscal year, 1915	123,914	12,436
Fiscal year, 1916	271,280	62,575
Fiscal year, 1917	421,397	203,179
Calendar year, 1913	223,814	7,250
Calendar year, 1914	111,552	3,275
Calendar year, 1915	222,472	37,119
Calendar year, 1916	276,034	80,458

*September distribution by countries not yet given.
†These two figures represent plate exports only and do not include steel sheets.

In THE IRON AGE of Aug. 9, 1917, attention was called not only to the large steel plate exports but also to Japan's share. It will be seen that, up to Oct. 1, these exports continued of large proportions and that Japan's share as late as August was still about 50 per cent of the total. Further facts concerning Japanese plate shipments are given elsewhere in this issue under Washington correspondence.

It is interesting to note that, for July, for the first time, the official data give separate figures for the destination of steel plates.

Wages of Sheet and Tin Plate Workers Advanced

The bi-monthly examination held Nov. 10 at Youngstown, Ohio, gives sheet workers 10½ per cent increase on a 5.25c. card; and tinplate workers 10 per cent increase on prices based on average sales of tinplate at $8.25 a box of 100 pounds. Wages of sheet workers are 96 per cent above the base fixed in the wage scale of the Amalgamated Association of Iron, Steel and Tin Workers and those of tinplate workers are 95 cents above the base. This increase will mean $2.50 a day more for rollers in the sheet mills averaging $25 a day. Puddlers' wages established for November and December at $11.80 a ton are a record in the history of the trade for this class of skilled workers.

COUNTRY-WIDE ADVANCE

Plan of Railroads Will Be Vigorously Resisted by the Shippers

WASHINGTON, Nov. 13.—The Western railroads have joined the Eastern roads in an application for higher freight rates and it is believed that the Southern roads will soon ask to be included, thus bringing before the Interstate Commerce Commission definitely the issue of allowing increases to the railroads of the entire country "to cover higher labor, material and supply costs." The application of the Western roads is for a general increase of an unspecified amount and will be heard by the Commission on Dec. 17, when it will be made a part of the pending 15 per cent case.

When the Commission ruled upon the application of the railroads for a 15 per cent advance last June, it granted certain minor increases to the Western carriers, but these roads, in their petition just filed, declare they are prepared to show that their net earnings have dwindled steadily since the early summer although gross revenues have been larger and the claim, therefore, is made that "to maintain efficient service required for the war and to make necessary improvements, part of the burden of the heavier operating costs must be passed on to the shippers."

The action of the Western roads and that anticipated on the part of the Southern carriers has alarmed the representatives here of certain large shippers' associations and as a result it is probable that the combined 15 per cent rate case will be sharply contested by these interests. The shippers' associations were disposed not to resist moderate increases if limited by the Commission to the carriers in Eastern territory, but are not prepared for a country-wide advance of 15 per cent. The representatives of the shippers' associations are also greatly incensed at the action of Comptroller of the Currency Williams in giving out an official statement expressing the opinion that the leading railroad systems of the country, in order to maintain reasonable market values of their securities, should be granted an advance in freight rates. However well meant this announcement was, it could hardly fail to arouse the antagonism of the organized shippers and it is now being vigorously denounced as an unfair attempt to prejudice the case in the minds of the members of the Interstate Commerce Commission. Clifford Thorne, representing large Western shippers of livestock and grain and so-called independent oil refiners, has made public a letter to Comptroller Williams, challenging his assertions and defying him to appear before the Commission.

Locomotive Orders

There were only 65 locomotives estimated as ordered in September with 647 in October bringing the total for the year to Nov. 1 to 5463 of which 3528 were ordered in the first half. The U. S. War Department has placed orders, since the middle of July, for no less than 2014 locomotives, a large number of which have already been built and shipped. Of this the Baldwin Locomotive Works received orders for 1834; the American Locomotive Co., 150 and the Vulcan Iron Works 30. The Chicago, Milwaukee and St. Paul has ordered 10 electric locomotives from the Westinghouse Electric & Mfg. Co. and 7 from the General Electric Co. The Egyptian State Railways has ordered 70 ten-wheel locomotives from the Baldwin Locomotive Works. The Chilean State Railways is inquiring for 20 locomotives, while inquiries have appeared from the Missouri, Kansas & Texas, the Atlanta & West Point and the Wheeling & Lake Erie.

Six sheet mills at the plant of the Mahoning Valley Steel Co. at Niles, Ohio, are now in operation, with prospects of getting the other two mills of this newly built works, in commission shortly. Jacob Waddell, formerly sales manager for the Brier Hill Steel Co., is the president and general manager.

MAY SEIZE COKE PLANTS

Fuel Administration Exasperated by Attitude of Mine Operators

WASHINGTON, Nov. 13.—Exasperated over the failure or refusal of coke producers in certain districts to observe the schedule of prices recently promulgated by the Government, officials of the Fuel Administration are preparing to take vigorous measures to compel manufacturers and dealers to observe strictly the scale authorized by Dr. Garfield. The power of the Fuel Administrator for the control of this situation is without limit and intimations have been made in several communications sent out from headquarters during the past week that the Government is prepared to invoke the extreme provisions of the Lever act and to seize plants and stocks of coke, if such measures are necessary to bring producers and dealers into line. Dr. Garfield is reluctant to take over any branch of the fuel industry as the Government is not equipped to operate it and probably would not be able to do so at full capacity, but he is determined to stop profiteering and he will not hesitate to invoke the law if necessary. It is the best opinion here that should the Government be forced to seize a plant or two, the results would be salutary and that it would not be necessary to take over any considerable number of ovens.

The following orders relative to prices for coke have been issued by the United States Fuel Administration:

"In each case the price shall be understood as the price per ton of 2000 lb., f.o.b. cars at the plant where coke is manufactured.

"All the maximum prices mentioned herein shall apply to car lots sold to consumers or to dealers for wagon delivery; any commissions paid to selling agencies or margins allowed to jobbers shall be paid by the vendors and shall not be added to the prices established hereby.

"In all cases where wagon deliveries are made, either by the coke producer or by dealers, a reasonable charge for such handling and delivery may be made. Such charge shall be subject to approval of the State fuel administrator.

"The maximum prices for coke made in ovens without by-product recovery east of the Mississippi River shall be as follows:

Blast furnace coke	$6.00 per ton
Foundry coke, 72-hour selected	7.00 per ton
Crushed coke, over 1-in. size	7.30 per ton

"The maximum prices for various grades of beehive coke made in districts other than those described heretofore shall bear the same ratio to the established price of the coal from which the coke is made as the average contract prices of the same grades of coke had to the average contract prices of coal during the years 1912 and 1913."

Plans for diverting a part of the tremendous coal traffic from the overworked railroad system of the country to inland and coastwise waterways are under consideration by the United States Fuel Administration. It is expected that a material saving in cars and motive power can be effected by utilizing water transportation for coal supplies wherever possible.

Major-General William S. Black, Chief of Engineers of the Army, in charge of river and harbor improvement work, is co-operating with the Fuel Administration in the water transportation plans. General Black has submitted to L. A. Snead, in charge of fuel supplies and distribution for the Fuel Administration, the results of an investigation into the terminal facilities and equipment available for the transportation of coal by water. The investigation showed clearly that a large saving in railroad transportation can be effected by utilizing all of the water transport facilities.

The shipment of coal from eastern fields to New England is one of the most striking instances of the opportunity for saving. At present large quantities of coal are shipped from Pennsylvania and West Virginia fields direct to New England points by rail. Facilities are available whereby practically all of this coal could be sent by a much shorter rail haul to tidewater at Baltimore, Philadelphia and New York, and thence by barge to New England ports. The longer rail haul keeps the coal in a much-needed car for a week or more, while the shorter haul could be made in about one-half of that time.

A detailed report is in course of preparation on all cases where long rail routes are being used in preference to available water routes, and the Fuel Administration will undertake to see that shippers take full advantage of water transportation wherever possible.

W. L. C.

Railroad Car Purchases

Practically 35,000 cars for use abroad have been closed since last week's issue and Italy is in the market for 3000 to 5000 cars.

The 30,000 cars for Russia were finally closed on Nov. 9 and in that connection it develops that 2500 of them are to be built by a new company, the Pacific Car & Foundry Co., with which William Pigott, vice-president Pacific Coast Steel Co. and identified with the Seattle Car & Foundry Co., is connected. The remainder of the cars were placed as follows: 10,000 cars to the American Car & Foundry Co., 10,000 cars to the Standard Steel Car Co. and 7500 to the Pressed Steel Car Co.

As already stated in these columns, the additional cars for the American expeditionary force in France were placed with eleven companies. The total, 4975, was distributed as follows: Box cars, 400 to the St. Louis Car Co., 400 to the Central Locomotive & Car Works, 450 to the Mt. Vernon Car & Mfg. Co., 500 to the American Car & Foundry Co. and 500 to the Pullman Co., a total of 2250. To the Standard Steel Car Co. were awarded 725 high-side gondolas; 1000 low-side gondolas were divided equally between the Cambria Steel Co. and the Pressed Steel Car Co. The American Car & Foundry Co. is to build 125 tank cars and the General American Tank Car Corporation an equal number. The Haskell & Barker Car Co. will build 250 refrigerator cars and the Southern Car Co., High Point, N. C., will build 500 flat cars.

Fuel Shortage Causes Trouble

YOUNGSTOWN, OHIO, Nov. 12.—The Bessemer steel mill of the Republic Iron & Steel Co. is idle this week, to give the finishing mills of the Brown-Bonnell works an opportunity to catch up. The finishing mills of the Republic here were shut down Tuesday, Oct. 30, because of a scarcity of fuel. The departments did not resume until Monday, Nov. 12, so that considerable steel accumulated with the steady operation of the Bessemer mill.

The Youngstown Sheet & Tube Co. is relining one of its Hubbard stacks. The other furnace was banked for some days because of a fuel shortage. The by-product coke works of this same company has been handicapped severely within the past two weeks because a supply of coal sufficient to keep the ovens operating to capacity was lacking.

The Carnegie Steel Co. reports all of its Bessemer furnaces at the Ohio Works here in operation. The Niles furnace is still out of blast. With the completion of the coal pulverizing plant, the McDonald bar mills will be put in partial commission. Two bar mills are reported to be in readiness.

The first delivery on the Canadian Government railway car order recently placed with the Canadian Car & Foundry Co., Montreal, will be made within the next two weeks. Some delay was caused through the inability of the car company to obtain steel for this business, but both the Nova Scotia Steel Co. and the Steel Company of Canada are now making regular deliveries, and within the next month the company will be turning out 50 cars a day.

Book Reviews

Hendricks' Commercial Register of the United States.—Pages, 2225, 7½ x 10 in. Published by the S. E. Hendricks Co., Inc., 2 West Thirteenth Street, New York. Price $10.

The twenty-sixth edition of this book contains as the distinctive feature an alphabetical section containing in one list the name, trade description and address of every company that appears in the main portion of the book. In addition to complete lists of producers, manufacturers, dealers and consumers of the products used by the iron and steel, mechanical, hardware, engineering, railroad, architectural, electrical, quarrying, contracting and kindred industries, a list of trade names, brands, etc., covering 212 pages, is included. This list, which was published last year for the first time, is a ready means of reference for purchasing agents and prospective buyers seeking for products that have distinctive names. The trade names which have formerly appeared in parenthesis after the manufacturer's name under the different classifications in the main portion of the book are still retained. The index to the trade classifications occupies 151 pages and covers over 50,000 trade references, an increase over the previous edition of approximately 5000 classifications.

Blast Furnace Construction in America. By J. E. Johnson, Jr. Pages xi + 415, 6 x 9 in.; illustrations, 247. Published by McGraw-Hill Book Co., New York, and for sale by THE IRON AGE Book Department. Price $4.00.

There are far too few American books relating to the metallurgy of iron or steel written by men actually in contact with the processes which they describe. Robert Forsythe's book "The Blast Furnace and the Manufacture of Pig Iron" is almost the only one relating to this important subject and this covers a somewhat different field from Mr. Johnson's book. It is fortunate that a man of Mr. Johnson's experience has had both the opportunity and the inclination to put in published form the results of his observation and study.

The book on the whole is an excellent one, clearly written and well illustrated, but it disappoints in the meager attention paid to several important parts of a furnace plant. The material in the book is taken from a series of articles which the author contributed to *Metallurgical and Chemical Engineering* and a second volume is to follow, containing the remainder of the series. For this reason occasional reference is made to data not contained in this volume.

The earlier chapters deal with handling the raw materials for the furnace including ore, coke and limestone and charging and distributing them in the furnace itself. The description of ore bridges, car dumpers, skips and other charging appliances is adequate and covers the field well. The advantage of each is carefully and clearly discussed. In the chapter on "Filling" too much space is devoted to the double bell top, both the simple and modified types as used on small furnaces, but the standard double bell top, for large furnaces and its vital proportions, is not reviewed. Much space is given to rotating and other types of distributors and these are well treated. This chapter would lead a novice to believe that either some type of ring bell or mechanical top was in universal use. No mention is made of inside distributors of the Killeen, MacDonald or Slick Type.

The economical use of the top gas is an important matter in a large plant and this is inadequately treated, both under boilers and stoves. None of the newer automatic burners of the Bradshaw or Turbeck type is mentioned. The boiler settings shown are standard trade cuts of coal-fired boilers which are not adapted to blast furnace gas. In a new edition the entire chapter on boilers should be rewritten. The chapter on cleaning the gas is largely a copy of papers by Forbes and Diehl on this subject; the gas analysis in this chapter does not agree with that in an earlier one.

Blowing engines of all types are well described to some length. Unfortunately, the author's experience apparently has not covered turbo blowers and these excellent and desirable blowing units are handled very unsympathetically. Their characteristics are such that they will probably eventually displace reciprocating machines entirely and a more careful analysis of their good traits is warranted. There would appear to be sufficient available data to disprove the old figure of 63 cu. ft. per pound of coke which is given in this chapter. Dry blast is described in much detail and the power and economical phases of the subject treated extensively.

A chapter is devoted to "Stoves" and most of the usual type are illustrated. Much of the space devoted to the obsolete cast iron stoves could have been used advantageously in treating some of the most recent advances in construction.

The construction of the furnace stack with reasons for the types adopted is described, and handling the slag and iron is treated in a full and satisfactory way. The addition of actual data on runner design would be helpful. A chapter is devoted to auxiliaries and plant arrangement and the general plans of several typical plants are given.

The book is a good one and while perhaps too dogmatically written, it is one which engineers and draftsmen in the blast furnace industry will find of great value.

S. M. MARSHALL.

Robert H. Treman, deputy governor of the Federal Reserve Bank of New York, has published a booklet entitled "Trade Acceptances." A trade acceptance is defined as "a time draft or bill of exchange drawn by the seller of merchandise on the buyer, for the purchase price of the goods, and accepted by the buyer, payable on a certain date, at a certain place designated on its face." The booklet sets forth how the use of acceptances will do more to increase American financial efficiency than almost any other element. It will permit a more economical distribution of merchandise and food products, through obtaining low rates of interest as trade acceptances can be rediscounted at a lower rate than any other form of mercantile paper. Experts have estimated that from two to three times the present volume of business under the prevailing "open book accounts" system can be done safely and conservatively on the same capital by the use of trade acceptances.

A report on the deterioration in the heating value of coal during storage, covering a five-year period, has just been issued by the Bureau of Mines, Department of the Interior, as Bulletin 136. The tests show that the amount of deterioration has commonly been overestimated. Except for the subbituminous Wyoming coal, no loss was observed in outdoor weathering greater than 1.2 per cent in the first year, or 2.1 per cent in two years. The bulletin, of which the authors are Horace C. Porter and F. K. Ovitz, may be obtained free of charge by addressing the director of the Bureau of Mines, Washington.

Poor's Intermediate Manual of Railroads is issued. It gives revised statements of the more important companies, issued for the new fiscal period in accordance with the requirements of the Interstate Commerce Commission. Bond statements, income accounts and balance sheets have been revised to the latest date. The work contains 1200 pages of text. It is the only book of the kind issued to date. It should be found very useful by brokers and financial institutions. Price $7.50 a copy. Issued by Poor's Manual Co., New York.

"New York of To-day," by Henry Collins Brown, is a very attractive little volume of interest to people throughout the country as well as to New Yorkers. It contains an immense amount of information entertainingly written and also has numerous illustrations. It is sold for $1.50, cloth, and $2, flexible leather, by the Old Colony Press, 15 East Fortieth Street, New York.

Electric Furnace in Norway's Iron Industry*

Present Stage of Electric Pig Iron—Progress in Electric Steel—Economy in Remelting Scrap in the Electric or Open-Hearth

BY HAAKON STYRI

At the end of the sixteenth and the beginning of the seventeenth century, Norway had a comparatively well-established iron industry, which, after a declining period in the hard years of war following 1800, again revived and flourished until the middle of the last century. Eighteen iron works were in operation and many prominent families made fortunes at that time. It is probable that from the same period originated the name "Norway Iron" for high-quality wrought iron. A constant decline in the iron industry followed until, at the end of the century, only one charcoal furnace at Naes was in operation utilizing its product for crucible steel.

A turning in the tide seemed to come with the steel-casting industry. An acid open-hearth, heated with generator gas, was built at Kristiania Staalverk, and a Tropenas converter with cupola outfit at Strömmen Staalverk. A third plant made a good profit by welding together plate scrap to billets, which were rolled and forged.

Pig Iron from Electric Energy

The application of electric energy in iron and steel-making gave a new impulse to the iron works, supported probably by the competition between owners of water falls who wanted to find some use for their power. The Jössingfjord Mfg. Co., in 1909, built an induction furnace of the Hiorth type. More interest centered in the electric production of pig iron, after the promising reports from the operation of the "Electrometall" shaft furnace at Domnarfvet and Trollhättan. The Electrometallurgical Committee, appointed by the Norwegian Government in 1907, reported favorably on the prospects, and with nation-wide support.

The Hardanger Jernverk, was formed at Tysaa. The type of furnace adopted here was the Electrometall but with modifications in design which, after the few experiments in Trollhättan, were considered necessary when coke was used for reduction. One furnace was built and put in operation in 1911 and another built before results from the first were obtained. The operation was not successful. The charge had a strong tendency to hang, caused partly by the narrow neck, and partly as later investigations have indicated by the limestone which fell into powder when burned and by the precipitation of carbon in the briquettes, causing many of these which were of a loose structure to burst.

This does not prove that coke cannot be used in the Electrometall furnace and it is said that in later tests in one of the larger new furnaces in Sweden, where coke alone was used for reduction, satisfactory results were obtained. Some recently published reports, however, indicate that reduction with coke was tried in the Helfenstein furnace in Domnarfvet, where the energy consumed was 2600 to 2700 kw.-hr., and the coke consumed 310 to 330 kg. per ton of pig. From the same source, we are informed that a Helfenstein furnace is in course of construction somewhere in Norway. Time will tell whether or not sufficient tests have been made to justify this new construction.

The Tinfos Furnace

Before the Hardanger Jernverk started operation, experiments were made from Jan. 1, 1910, at Notodden, with the 500 kw. furnace of the Bie-Lorentzen and Tinfos Paper-Fabric. After quite successful trials with coke as reduction material, the Tinfos Jernverk was formed, which built three 1200-kw. furnaces of the single-phase type, with bottom electrode, rectangular chamber, and two charging stacks.

Work started in 1912. In the beginning many difficulties had to be overcome, partly on account of poor electrodes and bad castings for water-cooled collars. Many furnace details had to be changed and the correct way of mixing and charging the material at hand had to be found. Most careful attention had to be paid to the physical properties of the coke. The product at first varied considerably in quality but now the furnaces operate very regularly. White and grey pig iron of high quality can be produced at will, competing with charcoal iron. It is of interest to note that most of the manganese in the ore is reduced. From data published, the energy consumed per ton is 2700 kw.-hr. for white pig and 3000 kw-hr. for grey pig, with 44 per cent iron in the ore.

The Tinfos Jernverk has had a very successful period since the war started, and particularly since the demand for high-grade pig increased. It was practically the only domestic plant which could furnish a small part of the pig iron that was formerly imported from Sweden, Germany and England and has thus materially helped in keeping the mechanical industries of Norway going. A Tinfos furnace has also been built at Ulefos, using phosphoric ore from the Faehn deposits. Foundry iron is produced, which is remelted in a Rennerfelt furnace and then run into stove castings.

Progress in Electric Steel

None of these plants has, until now, tried to convert the electric pig iron into steel; but electric steel making in the country has developed along the same lines as in other countries where electric furnaces have been adopted.

The most important company melting and refining scrap for tool steel and steel castings is the Stavanger-Staalverk, at Stavanger, Norway, which started in 1913. The scrap is melted in an open-hearth furnace and refined in a 5-ton Roechling-Rodenhauser single-phase induction furnace. This plant has gradually improved its product and now has a very good reputation for hammered bars and steel castings. The plant has been very prosperous during the last two years, and recently increased its invested capital to $1,000,000, in order to allow installation of more electric furnaces, a bar mill and electric annealing furnaces. It is also said to have discontinued the operation of its open-hearth for melting down the scrap, on account of the present prohibitive prices of coal.

A number of other small electric-furnace installations have been formed on account of the wartime profits in steel castings and special steels. A small Roechling-Rodenhauser furnace at Eureka, Christiania, makes acid-resisting steel; at Hamar, Hougsund, and Drammen, cast steel is made in Rennerfelt furnaces, and at Kongsberg and Naes tool steel is made in the same type of furnace.

The Rennerfelt and Heroult Furnaces

Most of the electric furnaces built in Norway are of the Rennerfelt type. The reason for this is that it is difficult to get material from countries other than Sweden, and the furnace is very well adapted to the remelting of scrap, for cast steel in small quantities. There is very little in the feature claimed as specific to this furnace, that the arrangement of electrodes serves to throw the arc against the bath. Anyone will find that an arc will play against the molten charge when, with single or polyphase current, the electrodes are placed at an angle to the charge. The arc will follow the path of least resistance, that is, where the gases are hottest between the electrode-ends and the bath. When starting to melt down cold scrap, the arc is not more steady than it is, for instance, in a 3-phase Heroult furnace, because of the cooling of the air from the

*From a paper presented at the thirty-second annual meeting of the American Electrochemical Society, Pittsburgh, Oct. 4, 1917. The author is metallurgist, Hussey-Binns Steel Co., Charlerol, Pa.

charge with the consequently unsteady air currents. The lining is very much exposed to radiant heat and the uneven heating of it has been the result of faulty shape of the furnace body, which has been improved in recent designs, approximating the well-known Stassano furnace.

The Heroult furnace is not, at present, in use in Norway for steel making, but it will probably be seriously considered by a new larger company. The excellent shape of the furnace body, which facilitates repair, and the simple arrangement of electrodes are of great advantage. Many details in the furnaces built by the United States Steel Corporation could certainly be improved upon. There ought to be sufficient room under the electrodes for mechanical charging, an essential point in the economy of operation. In a larger plant the electrodes should be arranged on the side, to allow a continuous charging platform for a battery of furnaces. Attention should also be given to the possibility of the freezing of the water in cold weather. All pipes, therefore, should be easy to drain. The device for lifting the doors and the manner of tightening them should be improved.

Much of the successful operation of the furnace depends on the kind of scrap that is used. To avoid losing time in melting, the complete charge should go into the furnace from the start, and it is very important that the melter pay attention to his lining when charging, as he can protect or cut the lining according to the way different material is placed.

Graphite Electrodes in Large Furnaces

In larger furnaces, from 16 to 20 tons, graphite electrodes are probably better than carbon electrodes because it is difficult to handle the large sized carbon electrodes, particularly when they break off in the furnace during operation. Besides, if private information is correct, they are more economical in use, at least when applied on molten charge.

The refining facilities in the Heroult furnace are very good. There is no difficulty in getting an oxidizing slag. The reducing action of the electrodes will not over-balance the oxidizing influence of the incoming air, which effect can be increased by roll scale and ore. When making high-carbon steel, in particular, it is of advantage to dephosphorize at the lowest possible temperature, in order to enable the greater part of the carbon to remain. In the preliminary testing, the manganese content will indicate the amount of phosphorus, when the content of both in the material charged is known. For desulphurization the furnace is ideal, because the slag can so easily be kept reducing by throwing in coke or coal, and, if necessary, ferrosilicon, whereas the temperature of the slag can be kept high.

A common disadvantage in the arc furnaces is that so much smoke is developed, which, in some places, has even resulted in strikes by the workmen. This fault is not shared by the induction furnace.

Where furnace installations are contemplated, the choice of furnace type will to a greater extent depend more upon the cost of installation and royalty than upon the kind of work that is to be done and the ease of operation. It is well to remember, in this connection, that the first and principal Heroult patents have now expired.

Present Conditions

In late years in Norway there has been a great desire to get iron and steel works which could produce shapes, plates, and other commercial steel in order that the country might be more independent of imports. During the present war this need has been bitterly felt, as it is extremely difficult to get commercial steel from the belligerent countries, which formerly furnished it all. Many private corporations have investigated the possibilities of starting a modern steel plant and much capital was expected to back the plans if they could be satisfactorily worked out, but the present soaring prices of all new construction has put a stop to further important development. Another reason for little progress in the plans was the difficulty in working the different local interests together into a national interest and the intervening of the Government has not improved the conditions.

It is of importance, however, that Government interest in the development has been created. The immediate result of this is that, as a strictly war measure, a premium on the production has been granted to Kristiania Spikerverk for building a second open-hearth furnace and a small bar mill and the extra funds necessary to build a new cupola and Tropenas converter has been voted to Strömmen Staalverk. It is rather discouraging for people interested in the electric iron industry in Norway to find that the Government considers it more opportune, economically, to support open-hearth and Tropenas converting and not electric steel melting when private interests find it best to work along the latter line; but the reason is probably that in the present emergency it is easier to get building material for open-hearth furnaces and converters, and wood and charcoal can be substituted for coal and coke.

Conditions are not promising for the production of steel on a larger scale in Norway. The operation of a coke blast furnace would demand the import of lump ore from Sweden, Spain or North Africa, besides the fuel from England and the same would to a less extent hold true for a large scale production of electric pig iron. For the conversion of pig iron to steel there would be little difference in the cost whether this was done in the open-hearth or electric furnace. The freight on some or all material used would increase the final cost considerably. The conditions are no better, when we remember that Norway and England are the only iron-producing countries which have no duty on imported iron.

Remelting Scrap in Electric or Open-Hearth

Better economical success could apparently, at least before the war, be expected for a company remelting scrap in electric furnaces, as the scrap was considerably lower in price than pig. The basic open-hearth would certainly melt the scrap somewhat cheaper than the electric furnace, but when the capacity of the latter is increased it is probable that the steel from an electric furnace using cold scrap would not cost more than $1 to $2 per ton more than the open-hearth steel, when the same quantity is produced, and the better quality of the electric steel would balance the difference. Increasing coal prices would improve the prospects for the electric-furnace melting. The difficulty would be to get the scrap.

The total annual import of steel into Norway is about 200,000 tons, from which 12 to 15 per cent is returned as scrap. The scrap from all parts of the country would therefore not amount to more than 30,000 tons and most of this is already disposed of by the plants in operation. A large company must, therefore, depend entirely on the supply of scrap from neighboring countries, with additional freight expense and at prices in competition with the foreign buyers.

The prospects can, of course, change. It is possible that concentrate can be used direct in an electric reduction furnace, at least where little attempt is made to utilize carbon monoxide in the reduction of the ore, by using the gas instead for heating pig-iron mixers, where the main decarbonizing could be done, for melting of scrap, and for heating of by-product coke ovens. The gas from the coke ovens could be sold to the city. The steel product could be finished in an induction or arc furnace.

Another method is now on trial, basing the operation on the direct use of low-grade ore by the Edwin-Westberg-Gröndal process. Interested Norwegians and Swedes have secured $150,000 for the purpose of testing the method on a commercial scale. The low-grade ore is crushed according to the structure and is treated in the furnace with reducing gases which are heated outside in a high-tension arc furnace, similar to the one used for the manufacture of saltpeter. The reduced iron is afterwards separated magnetically from the rock and the iron powder melted in an electric furnace.

The successful iron and steel works in Norway have based their production on high quality of product. The manufacture of structural steel is not and probably will not be tried in the near future on account of the competition from foreign countries. What Norwegians want and look forward to is the time when the country can again furnish iron and steel which comes up to the old standard of Norway iron.

EXPORTS BEING CUT DOWN

Partial Embargo in Effect on Many Tools

Large Demand in All Sections of the Country for Equipment to Manufacture Guns and Shells

A tightening of the restrictions on exportation of machine tools is noted. Manufacturers of tools which are in greatest demand for war industries, such as milling machines, grinding machines, lathes, 24 in. and larger, etc., have received letters within the past week from the Exports Administrative Board that licenses will not be granted hereafter for the exportation of such tools to the Northern neutral countries of Europe. Requests for licenses to export even to our Allies are being given close scrutiny.

Machinery demand in Eastern markets continues active, though there is not as large a number of new inquiries as have been noted in recent weeks. The Watertown Arsenal is still buying heavily and the Watervliet Arsenal will soon need a large quantity of equipment for a new cannon shop. The International Fuse & Arms Corporation, Bloomfield, N. J., has received a shell contract. The Bridgeford Machine Tool Works, Rochester, N. Y., is buying for an addition to cost $50,000 for making large tools. The Standard Ordnance Co. continues to buy for a munitions plant in Hamilton, Ohio. The Pacific Coast Shipbuilding Co., San Francisco, has bought equipment for a plate and angle shop.

A 250-ton gantry crane will be purchased by the Government for the Sandy Hook Proving Ground. The Champion Engineering Co., Kenton, Ohio, has sold four 5-ton cranes to the Fore River Shipbuilding Corporation.

There is an unusually large demand for cranes and hoists from shipyards and manufacturers in the Philadelphia district. The Baldwin Locomotive Works has issued the largest inquiry, calling for bids on 20 cranes, ranging in capacity from 20 to 150 tons. This concern is also buying other locomotive shop equipment, for use both in this country and in Russia, where it will erect a locomotive shop for the Russian Government. The William Cramp & Sons Ship & Engine Building Co. is in the market for six cranes, from 5 to 25 tons capacity. The Eastern Steel Co., Pottsville, Pa., wants a 25-ton crane and the Standard Steel Works Co. will buy cranes for its gun-machining shop at Burnham, Pa. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is inquiring for a large number of electric hoists for new destroyer shops. The New York Shipbuilding Corporation, Camden, N. J., has placed an order with the Pawling & Harnischfeger Co., Milwaukee, Wis., for six cranes for its new destroyer shops. The American International Shipbuilding Corporation is expected to close this week for seven 10-ton shop cranes and 45 3-ton jib cranes and the same number of 3-ton mono-rail hoists. The Sun Shipbuilding Co., Philadelphia, has bought two locomotive cranes for its shipyard at Chester, Pa. The United States Government will require a large number of locomotive cranes for terminals on the Atlantic seaboard, which are to be built at a total cost of $18,000,000.

The Worthington Pump & Machinery Corporation, Hazelton, Pa., has just issued another large inquiry for equipment to manufacture 75-mm. shells. The Bartlett & Hayward Co., Baltimore, Md., has placed large additional orders and will buy more for munitions work. With what is to come, this company's purchases will aggregate several hundred thousands of dollars. The Midvale Steel Co. is reported to be searching for large planers and other equipment for its ordnance plant. The Pennsylvania Railroad Co. is buying more tools for shipment to the American railroad in France. The Hess-Bright Mfg. Co. has placed another large order for grinding machines, which will make its grinding-machine equipment one of the largest in the country. The Pusey & Jones Co. is making important additions at its Wilmington, Del., shipyard, and is expected to enter the market for new equipment. The Chester Shipbuilding Co. has not yet closed on a large number of machines, for which bids were received some time ago. The American International Shipbuilding Corporation will buy a large number of pneumatic tools. The Tacony Ordnance Corporation is buying for a tool room at its new gun-forging plant at Tacony, Pa.

Large purchases for the Rock Island Arsenal are the feature of the Chicago machinery market. These orders will aggregate at least $1,000,000. Machine-tool dealers have been asked to furnish lists of tools for immediate shipment to motor truck manufacturers, who are in urgent need of new equipment. Demand for war work is on the upward trend in the Chicago territory and is expected soon to approximate the enormous demand which has prevailed for some months in the East. The Twin City Forge & Foundry Co., Stillwater, Minn., has obtained a $3,000,000 contract for 6 in. shells.

Dodge Bros., Detroit, who have a contract for recoil mechanisms for guns approximating $30,000,000, have issued an inquiry for 60 planers, according to information from the Cleveland machinery market. Presumably other equipment will be inquired for soon. The Osgood Mfg. Co., Marion, Ohio, is inquiring in Cleveland for 75 lathes for shell work. A Cleveland company wants 100 screw machines, 24 grinders and some other tools for shell work, and another Cleveland company is inquiring for 10 21-in. lathes. Still another inquiry is for 60 to 70 machines, including lathes, grinding, milling and drilling machines. A Cleveland builder has received an order for 22 turret lathes from the Rock Island Arsenal. The Salisbury Wheel & Mfg. Co., Jamestown, N. Y., has bought 23 turret lathes for machining gun carriage hubs. The Interstate Motor Co., Muncie, Ind., wants 15 or 30 turret lathes for similar work. The Lincoln Motors Co., Detroit, has

bought additional equipment, including lathes and radial drills, for airplane engine work. The Wellman-Seaver-Morgan Co., Cleveland, has been awarded a contract for the manufacture of condensers, uptakes and stacks for submarine destroyers, and an addition will be built at its Akron, Ohio, works. Some standard lathes and drilling machines will be installed, but most of the machinery will be of a special character. The same company has taken another contract for steering engines for destroyers, and work on these is under way at the Akron plant. The two contracts, it is reported, will aggregate $5,000,000. Cleveland crane builders are bidding on three 350-ton hammer-head fitting-out cranes for navy yards. The cranes will be the largest of this type ever built and the cost will approximate $2,000,000. The American Clay Machinery Co., Bucyrus, Ohio, will equip a new unit for the manufacture of 6-in. shells. It placed an order last week for 50 21-in. lathes and is expected to buy other equipment. The Elyria Machine Co., Elyria, Ohio, which also has a Government order for shells, bought 20 lathes of 21 and 25 in.

The New England machine tool market is being combed for tools for the Watertown Arsenal and the new shops of the Fore River Shipbuilding Corporation. The Osgood Bradley Co., Worcester, Mass., is buying heavily for a gun-carriage contract.

Michigan automobile manufacturers have pledged their support of the Government program of utilizing motor plants for war work. The Ford Motor Co., Detroit, has taken a contract for 5000 Liberty motors.

New York

NEW YORK, Nov. 13.

New Government contracts for shells and projectiles have been awarded to manufacturers in the East, resulting in demand for new machine-tool equipment, but for the most part these orders have gone to companies whose plants are already pretty well equipped because of former munitions work. The International Arms & Fuse Corporation, Bloomfield, N. J., has received a large contract for 75-mm. shells for use in French guns and will probably be in the market for additional equipment.

Nearly all dealers in this market report that new inquiry was lighter during the past week than for some months. Miscellaneous inquiry for civilian work has fallen off almost to nothing. This may be due to the difficulty of obtaining satisfactory deliveries or the high prices, or a combination of the two. Sellers are showing little interest in inquiries except for Government work, as they claim it is useless to load their order books up with commercial orders when there can be nothing definite as to delivery. Of smaller tools there is a good supply. Small lathes have become almost a drug on the market.

The Watervliet Arsenal will build a new cannon shop, 200 x 300 ft., for which equipment is to be purchased soon. The Bridgeford Machine Tool Works, Rochester, N. Y., is building a $50,000 addition for the manufacture of large machine tools and is purchasing equipment. The Staten Island Shipbuilding Co., Port Richmond, N. Y., will purchase equipment for a machine shop. The Government is seeking a shaper, milling machine and an engine lathe for the submarine base at New London, Conn. The Bausch & Lomb Optical Co., Rochester, N. Y., is buying tools for making gun sights and periscopes. The Standard Ordnance Co., 115 Broadway, New York, continues to buy for a munitions plant in Hamilton, Ohio. This company is affiliated with the Mosler Safe Co.

The Pacific Coast Shipbuilding Co., San Francisco, has bought about 25 machines for a plate and angle shop. The Fore River Shipbuilding Corporation, through the Aberthaw Construction Co., Boston, has placed an order for four 5-ton cranes with the Champion Engineering Co., Kenton, Ohio. This makes 62 new cranes which have been bought for the Fore River destroyer shops, in addition to several second-hand cranes. The Staten Island Proving Ground will purchase a 250-ton Gantry crane. A tentative inquiry, which has just been issued, will be followed with specifications soon.

The De La Vergne Machine Works, with plant at the foot of East 138th Street, New York, has been sold to the William Cramp & Sons Ship & Engine Building Co., Philadelphia, which will use it for the manufacture of oil engines and refrigerating machinery for war vessels. The De La Vergne company is capitalized at $1,500,000 and its annual output has had a value of $1,200,000 to $2,000,000. New equipment will soon be purchased.

The Simplex Automobile Co., New Brunswick, N. J., has awarded to Westinghouse, Church, Kerr & Co., New York, the contract for a large extension to its aluminum foundry.

The Central Railroad of New Jersey has awarded to Westinghouse, Church, Kerr & Co., New York, the contract for a boiler plant at its railroad coaling station at Communipaw, N. J.

The American Can Co., 120 Broadway, New York, has taken bids for the erection of three additions to its plant near Elizabeth Avenue, Newark, N. J. The structures will comprise a one-story forge shop, 60 x 70 ft.; three-story, reinforced-concrete manufacturing plant, about 40 x 240 ft.; and two-story office building. N. M. Loney is engineer.

The Toch Screw Machine Products Corporation, Eighth Street, Long Island City, N. Y., has purchased property, about 75 x 100 ft., adjoining its plant, which, it is said, will be used for extensions.

The Bario Metal Corporation, New York, has been incorporated with a capital of $90,000 to manufacture electrical furnaces. N. Herbschleb, P. Demiles and H. Jenkins, 31 Park Row, are the incorporators.

The Universal Shell Fuse Co., New York, has been incorporated with a capital of $10,000 to manufacture fuses. The incorporators are L. F. Sniffin, W. J. Powell and F. K. Welton, 49 Wall Street.

The Bemis Brothers Bag Co., St. Louis, manufacturer of package containers, is having plans prepared for the construction of a new plant on Fifty-second Street, from First to Second avenues, Brooklyn, N. Y. It will be two and three stories, of reinforced-concrete, about 85 x 700 ft., and is estimated to cost $300,000. G. W. Wadleigh is engineer. Local offices are at 61 Broadway.

The Colman Machinery & Tool Co., New York, has been incorporated with a capital of $10,000 to manufacture tools and machinery. F. B. Knowlton, W. Metkiff and J. Gill, 154 Nassau Street, are the incorporators.

The Reading Chassis & Motor Corporation, New York, has been incorporated with a capital of $100,000, to manufacture automobile parts. C. W. Bliss, S. S. Shears and E. Cahn, 233 Broadway, New York, are the incorporators.

The Himoff Machine Co., 50 Church Street, New York, has increased its capital from $100,000 to $250,000.

The L. M. F. Engineering Co., Fourth Avenue and Tenth Street, College Point, L. I., manufacturer of airplanes, etc., has had plans prepared for a new one-story plant, about 100 x 170 ft., to cost $150,000.

The Eureka Specialty Mfg. Co., New York, has been incorporated with a capital of $100,000 to manufacture automobile accessories. E. M. Carlson, W. H. David and M. W. Richard, 674 Academy Street, are the incorporators.

The Morse Dry Dock & Repair Co., foot of Fifty-sixth Street, Brooklyn, is considering the erection of a one-story addition, about 90 x 200 ft., to cost $20,000.

The W. F. Meyers Machine Co., Inc., Hamilton Street, Long Island City, N. Y., manufacturer of diamond saws and stone-cutting machinery, will build a two-story addition, about 15 x 34 ft.

Richard Kramer, Classon Point, L. I., and associates have incorporated the Fidelity Tire & Rubber Co., Jersey City, N. J., to manufacture automobile tires, etc. James L. Meltzer and F. O. Sheehan, both of New York, are also interested in the company.

Burdick & Son, Hamilton and Mosher streets, Albany, N. Y., operating a sheet metal works, have had plans prepared for a four-story addition to cost about $50,000.

The Vecchio Mfg. Co., Albany, has been incorporated with a capital of $10,000 to manufacture electrical machinery. L. Vecchio, J. A. Pabula and F. Mondello, are the incorporators.

The Simmons Machine Co., Broadway, Albany, has had plans prepared for a one-story extension, 120 x 120 ft., to cost about $20,000.

The Gifford-Wood Co., Hudson, N. Y., manufacturer of ice and coal handling machinery, has had plans prepared for an addition, about 75 x 150 ft., to cost $30,000.

The North Atlantic Shipping Corporation, Pearl River, N. Y., has been incorporated in Delaware with a capital of $100,000 to operate a shipbuilding plant. Arthur R. Oakley,

Pearl River; Cornelius E. Cole, Hackensack, N. J.; and Paul E. Britsch, New York, are the incorporators.

The American Emblem Co., Columbia Street, Utica, N. Y., will erect a new two-story factory, about 40 x 50 ft., on Genessee Street, New Hartford, N. Y., to cost about $15,000.

The R. G. Packard Co., Twenty-eighth Street, Bayonne, N. J., has commenced dredging work on its property on the Raritan River, Perth Amboy, N. J., which will be used, it is said, as a site for shipbuilding works. It recently acquired about 40 acres of land, adjoining its present holdings.

The Samuel L. Moore & Sons Corporation, Front Street, Elizabeth, N. J., iron founder, has conveyed to the Moore Shipbuilding Co., a subsidiary of the Bethlehem Shipbuilding Co., 69 acres of land at Roosevelt, formerly used by the Canda Car Co. It is reported that the site will be used for a new shipbuilding plant.

The Standard Aero Corporation, Elizabeth, has awarded a contract for the erection of a new two-story plant, 50 x 550 ft., and two-story office building, 60 x 140 ft., at Linden, to cost about $250,000.

The Schoellner & Horbach Mfg. Co., Newark, has been incorporated with a capital of $125,000 to manufacture jewelry. Karl A. Horbach, J. W. Schoellner and Joseph P. Rowley are the incorporators.

John Regner, Newark, will erect a new one-story welding shop at 68-72 Gotthart Street.

The Saylor Tool Works, Newark, has been incorporated with a capital of $50,000 to manufacture tools. The incorporators are Harry M. Saylor, 328 Washington Street; Frank W. Bird and Charles E. Patterson, Newark.

The Newark Bay Shipyard, Newark, has been organized to operate shipbuilding works at Port Newark Terminal. H. R. Sutphen, 5 Nassau Street, New York, heads the company.

The Irvington Mfg. Co., Coit Street, Irvington, N. J., manufacturer of tools, will erect a one-story brick addition to cost about $8,000.

Catalogs Wanted

Elmer P. Morris, iron and brass founder, 126 Liberty Street, recently lost a valuable collection of catalogs in a fire and asks manufacturers to send duplicate catalogs with discount sheets for export trade.

Buffalo

BUFFALO, Nov. 12.

The Fore River Shipbuilding Corporation, Quincy, Mass., a subsidiary of the Bethlehem Shipbuilding Corporation, has filed plans for the construction of a one-story machine shop at the site of its new turbine plant, Vulcan Street, Buffalo.

The Miller-Ulrich Machine & Tool Works, Buffalo, has been incorporated with a capital of $20,000 to manufacture tools, etc. F. and A. Miller and C. Ulrich, Buffalo, are the incorporators.

The Machinery Products Co., Buffalo, has been incorporated with a capital of $15,000 to manufacture machinery specialties. The incorporators are C. Pond, F. H. Fowler and J. A. Carmon, all of Buffalo.

The Dyneto Electric Corporation, Syracuse, N. Y., manufacturer of electric apparatus, has acquired a four-story building, 75 x 100 ft., on Park Street, for an extension to its works.

The Illinois Platinum Corporation, Eddyville, N. Y., has been incorporated with a capital of $17,500 to manufacture platinum specialties. A. D. Ranstead, E. P. Bellows and G. V. Reilly, 65 Cedar Street, New York, are the incorporators.

The Rochester Tire Co., Rochester, N. Y., has been incorporated with a capital of $500,000 to manufacture automobile tires. The incorporators are Earl H. Crowder, Buffalo; Henry J. Crowder, New York; and Ernest W. Ewell, Lancaster, Pa.

The Perfecto Traffic Corporation, Rochester, has been incorporated with a capital of $60,000 to manufacture motors, trucks, etc. The incorporators are W. B. Hopkins, H. D. Hutcheson and F. E. Olmsted, all of Rochester.

The Fayette & Porter Mfg. Co., Oswego, N. Y., has been incorporated with a capital of $25,000 to manufacture plumbers' supplies. G. E. Porter, H. S. Lavere and G. B. Fayette are the incorporators.

The Ferguson Steel & Iron Co., Buffalo, is building a power house, 30 x 130 x 30 ft., at Bailey Avenue and the New York Central Railroad.

An addition to the laboratory of the Rensselaer Polytechnic Institute, Troy, N. Y., is to be erected at a cost of $100,000.

The O'Neil Iron Works, Inc., Buffalo, recently incorporated with a capitalization of $500,000, has purchased the Lake Erie Boiler Works at Perry and Chicago streets, Buffalo, which it will immediately equip for the manufacture of sugar mill machinery. The foundry connected with the plant, which has been shut down for several years, will be put in operation at once. It is expected about 70 men will be employed within a short time. The officers are Laurence W. O'Neil, president; William D. O'Neil, vice-president, and John F. O'Neil, chairman of the board of directors, all of whom formerly owned the Fulton Iron Works, St. Louis, which was recently sold. The company expects to commence work on Government orders as soon as the remodeling of the plant is completed.

The Henry Cheney Hammer Corporation, Little Falls, N. Y., has been incorporated with a capital stock of $100,000. J. E. Hemstreet, K. E. Morgan and D. J. Williams are the directors.

The Erie Railroad Co., Frederick D. Underwood, president, has let contract for additions and repairs to its East Buffalo shops. A Robbins coal handling plant will be installed.

The Hornespeed Propelling Co., Buffalo, recently incorporated with a capital stock of $1,000,000, has completed plans for the erection of a factory for the manufacture of marine propellers, ventilators and other specialties.

The Stewart Motor Corporation, manufacturer of motor trucks, is building an addition, 51 x 110 ft., to its plant on East Delavan Avenue and the New York Central Railroad Belt Line.

The Chamber of Commerce, Batavia, N. Y., has negotiated with a Canadian steel company to take over the plant of the Worden Co. on Evans Street to manufacture shells for the United States Government, for which the Canadian company holds a contract. The plant is to be enlarged at once and operations will begin Jan. 1.

The Cutler Desk Co., Buffalo, will build an addition, 50 x 152 ft., to its plant at Churchill Street and the New York Central Railroad.

The Garoga Electric Power Co., Garoga, N. Y., has been incorporated with a capital stock of $200,000 by J. T. Norton, W. A. Dunne and G. C. LeCompte, Troy, N. Y.

The Buffalo Forge Co., Buffalo, is building a $25,000 addition to its plant at Broadway and Mortimer Street.

The Fero Engineering Co., Rochester, has been incorporated with a capital stock of $57,500 to manufacture motor trucks, trailers and engines. The incorporators are H. D. Hutcheson, Rosewood Terrace; W. S. Strowger, 11 Lamberton Park, Rochester, and G. S. Garlock, Phelps, N. Y.

New England

BOSTON, Nov. 12.

Every metal working plant in New England is fast rounding into a volume of output greater than ever attained. The pressure of war business is being felt particularly by machine tool makers who are receiving a flood of orders from all sections of the country. Locally, the Government plants are the large buyers, but it is difficult to ascertain the amount of business they are placing as the old-fashioned method of putting out large lists and waiting for bids seems to have been mostly abandoned in favor of direct buying of machines as fast as a maker can give a delivery date that, to some degree, fits the requirements of the plant equipment program. The Fore River Works and the Watertown Arsenal are combing the market for machines and it is understood have only begun on the lists they will ultimately order. Large orders are being placed for equipment for gun and aviation plants in France and work for these is being pushed as fast as possible.

The attitude of labor, as shown by the strikes at Watertown, Fore River and Squantum, is causing some uneasiness and there is a great interest in the final outcome. Private corporations and the smaller shops will find it difficult to retain their present working forces if much greater concessions are given to the men employed in munition and shipbuilding work. As pointed out in the recent report of the Government committee on housing, the city of Bridgeport will need 10,000 more men by Jan. 1 and the working forces in New Haven, Waterbury and Hartford must be greatly increased. Unless the Government finds an effective solution for the labor problem of this section, most manufacturers expect to find their output lessened by labor shortage or labor troubles.

The Connecticut Brass & Mfg. Corporation, a new organization to be capitalized at $11,000,000, will take over the Connecticut Brass Corporation, West Cheshire, Conn., and the Pilling Brass Co., Waterbury, Conn. The combined output of the two plants will be 2,000,000 lb. per month. The West Cheshire plant has been in operation for 60 years and the Pilling business was started in 1907.

The Scovill Mfg. Co., Waterbury, Conn., is reported to be preparing to erect another large addition as a result of further Government orders.

The Marine Engineering Co., Boston, has been incorporated with authorized capital stock of $40,000 by Frank Crowley, Winthrop; Fred W. Brigham, Quincy, and Walter Kilvert, Lynn.

The Antrim Safety Lock Co., Worcester, Mass., has been incorporated with authorized capital stock of $30,000. Raymond B. Fletcher, Shrewsbury, is president and Robert W. Jameson, Hancock, N. H., treasurer.

The foundry of the Wyman-Gordon Co., Worcester, was damaged by fire Oct. 30, with a loss of about $2,500.

The Bernitz Method Co., Boston, has been incorporated with authorized capital stock of $10,000. The incorporators are Ernest Bernitz, South Boston; Oscar Nygard, Mattapan, and Obert Sletten, Cambridge.

The Spencer Wire Co., Worcester, has begun the erection of a two-story addition, 51 x 60 ft.

The Gile Marine Engine Co., 50 Foster Street, Somerville, Mass., has awarded a contract for a one-story machine shop, 75 x 100 ft.

The General Electric Co., West Everett, Mass., has awarded a contract for an addition to its foundry, 42 x 210 ft., one story. It has also placed an order for 1000 tons of steel for plant extensions at West Lynn, Mass.

The Simplex Tool Co., Woonsocket, R. I., has moved into new factory on Worrall Street. The capacity of the plant will be tripled in the new quarters.

Charles A. Jackson, Inc., Boston, has been incorporated with authorized capital of $10,000 to manufacture machinery and electrical appliances. Charles A. Jackson, Newton, is treasurer.

The Trimont Mfg. Co., Boston, has awarded a contract for a two-story addition, 45 x 85 ft.

The Osgood Bradley Car Works, Worcester, Mass., has received a contract for 9900 gun carriages and will erect new buildings and rearrange some of the existing ones in order to carry out the contract which involves approximately $4,000,000. It is buying a large equipment of machine tools.

The Pratt & Whitney Co., Hartford, Conn., now has 3300 employes at work and is steadily enlarging its working force. It is rushed with orders for machinery for the production of arms and ammunition and is not taking orders for machines for other purposes. All departments are working until 9 p. m. three nights a week.

The plant of the Maxim Munitions Co., Derby, Conn., at which there has been a strike for some weeks, has been closed, throwing 350 out of employment. The United States Cartridge Co., which took over the plant after the strike started, refuses to state whether the closing is to be permanent.

The American Brass Co., Waterbury, Conn., has awarded a contract for an addition, 42 x 51 ft., to a building on Washington Street.

The Pratt & Cady Co., Hartford, Conn., has awarded a contract for an addition, 35 x 100 ft., three stories.

The Standard Brass Co., New London, Conn., is to build an addition, 65 x 76 ft., and a boiler house, 29 x 42 ft.

After reorganization, the John Davenport Co., founder, Stamford, Conn., recently acquired by A. B. Venesch and Morris C. Rosenbaum of A. B. Venesch & Co., bankers, New York, expects to expend $500,000 in extensions and equipment and to double its working force.

The Colt Patent Fire Arms Mfg. Co., Hartford, Conn., has taken out permits to build a one-story testing department, 40 x 252 ft., and a one-story storehouse, 70 x 162 ft.

The Marlin-Rockwell Corporation, New Haven, Conn., is remodeling part of the Mayo radiator plant, which it owns, for the manufacture of rapid-fire guns. It will continue to occupy one-half of the plant to the manufacture of radiators.

The Coin Controlled Clock Co., Bridgeport, Conn., has been incorporated in Delaware with capital of $1,000,000 to manufacture a special coin-controlled clock. E. F. Bennett, E. Fish and L. C. Sayles, Bridgeport, are the incorporators.

Philadelphia

PHILADELPHIA, Nov. 13.

Buying for Government work continues on a large scale in this market, though the past week has brought out fewer new inquiries. The Worthington Pump & Machinery Corporation, Hazelton, Pa., has been awarded a contract for 75 per cent. shells for French guns, in addition to a Government contract received some weeks ago, and is in the market again for a large quantity of equipment. The Bartlett & Hayward Co., Baltimore, which has large Government contracts, purchased additional equipment last week and will be in the market for more. With what is to come, the total purchases of this company will aggregate several hundred thousand dollars. The Midvale Steel Co. is reported to be searching for large planers and other equipment for its gun shop.

The Baldwin Locomotive Works, which is erecting a large erecting shop, is in the market for more than $500,000 worth of cranes, and is also buying other locomotive shop equipment. A party of Baldwin men have left for Russia to take charge of locomotive building in that country and machines are also being bought for their use. The crane requirements for the new Baldwin shop are as follows:

Four 100-ton, two 50-ton trolleys.
Four 150-ton, two 75-ton trolleys.
Two 70-ton, two 35-ton trolleys.
Two 50-ton, two 25-ton trolleys.
Eight 20-ton, two 10-ton trolleys.
All are to be of the same span, 74 ft. 8 in.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, is in the market for two 25-ton cranes, 55 ft. 7½ in. span; two 15-ton cranes, same span, and two 5-ton, 26 ft. span. The Eastern Steel Co., Pottsville, Pa., wants a 25-ton crane for its structural shop and the Standard Steel Works Co. will buy several cranes for its gun machining shop at Burnham, Pa. The New York Shipbuilding Corporation has bought six small cranes from the Pawling & Harnischfeger Co., Milwaukee. The American International Shipbuilding Corporation, Hog Island, is expected to close this week for seven 10-ton traveling cranes and 45 3-ton jib cranes and mono-rail hoists. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is in the market for a large number of electric hoists for new destroyer shops. It will also buy other equipment. The Sun Shipbuilding Co., Philadelphia, has bought two locomotive cranes for its shipyard at Chester, Pa.

The William Cramp & Sons Ship & Engine Building Co. is expected to come into the market shortly for more equipment for destroyer work and also for adding to the equipment of a plant in New York it has bought for the manufacture of oil engines. It is expected that the Chester Shipbuilding Co., Philadelphia, will soon do considerable additional buying.

The Pennsylvania Railroad Co. is again buying tools for shipment to France for the railroad work under way there for the United States Government. The Baltimore & Ohio Railroad, it is reported, will soon issue a list of tools required for replacement in its shops. The Tacony Ordnance Corporation is buying equipment for a tool room at its new gun-forging plant. The Hess-Bright Mfg. Co., Philadelphia, has bought more grinding machines for ball-bearing work. The Pusey & Jones Co., Philadelphia, is making important additions at its Wilmington, Del., shipyard and is expected to buy more equipment. The American International Shipbuilding Corporation will close soon for a large number of pneumatic tools for shipbuilding.

The Edgewater Steel Co., Edgewater Station, Oakmont P. O., Pa., which recently issued a large list of tools required for machining big guns, has let a contract to the Austin Co., Cleveland, for the construction of a factory extension to cost about $100,000.

The United States Government will establish three terminal stations on the Atlantic seaboard, one near Norfolk, Va., one near Baltimore and the third on the Raritan River, New Jersey. The cost will approximate $18,000,000. A large number of locomotive cranes will be required.

The Tioga Steel Co., Philadelphia, has taken bids for the erection of a one-story addition, about 100 x 106 ft., comprising a second story to the present building.

The Philadelphia & Reading Railroad, Philadelphia, has taken bids for the erection of a one and two-story machine shop and engine house at Tulip and Emerald streets.

A new one-story power plant, about 35 x 100 ft., is planned by the Hulton Dyeing & Finishing Co., Philadelphia, at its works at Frankford Junction.

Haines, Jones & Cadbury, Ridge Avenue, Philadelphia, manufacturers of plumbers' supplies, steam fittings, etc., have taken bids for additions to their plant at Twelfth and Spring Garden streets.

The Dunbar Automobile Body Co., Thirty-seventh and Filbert streets, Philadelphia, manufacturer of automobile bodies, parts, etc., is having plans prepared for improvements at its plant.

The Innes Grain Shocker Co., Philadelphia, has been incorporated in Delaware with capital of $30,000 to manufacture agricultural implements. F. R. Hansell, Philadelphia; J. V. Pimm and S. C. Seymour, Camden, N. J., are the incorporators.

The Bernstein Mfg. Co., Allegheny Avenue, Philadelphia,

manufacturer of metal beds, bed springs, iron and steel shapes, etc., has awarded a contract for the erection of a two-story addition to its foundry, about 47 x 90 ft.

J. McCaffrey, 1624 South Eighteenth Street, Philadelphia, will make improvements to his foundry at 2318 Washington Avenue, to cost about $2,500.

The new plant of the Zee-Zee Rubber Mfg. Co., Trenton, N. J., to be erected at Yardville is estimated to cost about $500,000 for buildings and machinery and will consist of two two-story structures, 50 x 160 ft., and 40 x 125 ft., respectively; one-story mill building, 50 x 200 ft.; and one-story factory, 50 x 200 ft. The plant will be equipped for a daily output of about 900 completed automobile tires and 5000 inner tubes.

The Delion Tire & Rubber Co., Trenton, N. J., will make extensions and improvements in its plant to cost about $18,000.

The Rush Motor Co., Camden, N. J., has been incorporated with a capital of $100,000 to manufacture automobiles. Elmer Johnson, Jacob Liffman and Nathan Raidemann, Camden, are the incorporators.

The New York Shipbuilding Corporation, Camden, N. J., will build a one-story addition to its machine shop, 134 x 140 ft., and an addition to its forge shop.

The Mountain Glass Machine Co., Port Allegheny, Pa., has been incorporated with a capital of $20,000 to manufacture glass-making machinery. H. R. Hilton is the principal incorporator.

The Sheldon Axle & Spring Co., Conyngham Avenue, Wilkes-Barre, Pa., manufacturer of axles and springs, is considering the construction of a two-story extension, about 60 x 200 ft.

The Adder Machine Co., Wilkes-Barre, Pa., manufacturer of adding machines, is planning for the erection of a one-story brick addition, 46 x 52 ft.

O. H. Shenk, Ridgeway, Pa., will establish a plant for rebuilding used automobiles at the coach factory of Ralph Rosenburg, Rohrerstown, recently acquired.

The Stanley J. Flagg Co., Stowe, Pa., manufacturer of pipes and tubing, has taken bids for the erection of a one-story addition, 23 x 120 ft., to its No. 5 building.

The Donaldson Iron Co., Broad Street, Emaus, Pa., manufacturer of pipes and tubing, is planning for the erection of a new one-story molding plant.

The Pennsylvania Bronze Foundry Co., Seventh and Camp streets, Harrisburg, Pa., has disposed of its present plant to the Atlantic Refining Co. The company is planning for the erection of a new one-story foundry on property at Seventh and Emerald streets, with total area of 158 x 245 ft.

The Armstrong Cork Co., Pittsburgh, Pa., has acquired a tract of land extending from Liberty Street to Jackson Street, Lancaster, Pa., in the vicinity of its present works and is said to be planning for the erection of extensions.

The Johnstown Traction Co., Johnstown, Pa., is building a new one-story car repair works, 54 x 170 ft., at Coppersdale, to cost about $10,000.

The Garrison Motorcycle Co., Wilkes-Barre, Pa., has been incorporated in Delaware with capital of $10,000 to manufacture motorcycles. The incorporators are Winifred D. Garrison, Wilkes-Barre; Russell Garrison, Dorrancetown, Pa.; and H. S. Tawrowski, Trucksville, Pa.

Baltimore

BALTIMORE, Nov. 12

The Cecilton Electric Light & Power Co., Cecilton, Md., has been incorporated with $2,500 capital stock to generate electric current. The incorporators are William H. Anderson, Enoch S. Short, William Luthringer, William H. Brown and R. Markley Black.

Plans are being made by the Atlantic Coast Line, Wilmington, N. C., to rebuild the engine repair shops recently destroyed.

H. A. Tuggle, Keysville, Va., is seeking prices on machine shop equipment.

The American Steel & Bottlers' Supply Mfg. Co., South Boston, Va., has been organized with $750,000 capital to manufacture bottle washing machines. R. S. Barbour is president.

The Guardian Motors Co., Detroit, Mich., has acquired property on the Elizabeth River, Norfolk, Va., and contemplates the erection of a reinforced-concrete plant, 100 x 500 ft., for the manufacture of automobiles. Temporary works, 50 x 100 ft., will be erected immediately.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has commenced the erection of several additions to its plant which includes six new shipways, shops and construction buildings, as well as an office building to cost about $100,000. The company is said to have approved an appropriation of about $6,000,000 for extensions.

Fire, Nov. 2, destroyed the automobile and carriage manufacturing plant of Cahill & Co., Second and French streets, Wilmington, Del., with loss estimated at about $200,000.

Chicago

CHICAGO, Nov. 12.

The Rock Island Arsenal, Colonel Burr commandant, is actively purchasing tools, the value of which is between $2,000,000 and $3,000,000. These tools are required for gun carriage and recoil equipment to be made at Rock Island under the supervision of French officers for 75 mm. French guns. French patterns and blueprints loaned by that government will be used, the work being done in a separate shop which will not interfere with the regular production of the Arsenal. Only the carriages and recoil mechanism are to be made at Rock Island, the guns presumably being made elsewhere in this country. Many orders have been placed with far more to come. Among the tools specified are 2 planing machines, 24 24-in. lathes, 20 No. 4 vertical milling machines and 13 4-ft. radial drilling machines. There are a large number of miscellaneous tools as well, including lathe and milling machines. A large order for turret lathes has been placed and some crank shapers have been purchased.

A feature of the lathes is that most of them are to have long beds and to be equipped with metric screws for manufacturing metric sizes. Standard tools have so long been sold in Continental Europe that this requirement imposes no hardship on the builders. They have been long prepared to furnish metric screws, or transposing gears which will accomplish the same result. Two Chicago companies now have contracts for the delivery of guns or their parts made to metric measurements, the designs of the guns being French. Though nothing official is stated on the subject a natural deduction is that ordnance made at Rock Island is to be in accordance with French design, presumably permitting interchangeability of parts, and the use of French shells.

The Military Truck Production Section of the Quartermaster's Department, United States Army, Christie Girl, director, is asking machine-tool dealers to report as to the kind and number of tools they have available for shipment, including those they can locate outside of their warerooms, in this way, it is supposed, to aid manufacturers who have taken truck contracts and find it difficult to obtain the necessary equipment. The information requested is no small matter inasmuch as descriptions of the tools, their condition, maker, geographical location, etc., is wanted.

Great as the war demand now is, it is still on the upward trend and sellers see times ahead which will closely approximate those which have prevailed in the East. They find some consolation in the fact that the operations of the Priorities Board will relieve them to a considerable extent by directing where deliveries shall be made. Without this assistance the task would be almost hopeless and of a most distracting sort.

It is reported from Washington that Dodge Bros., Detroit, have taken a $30,000,000 contract for munitions and will build a new plant to handle it, which concerns local sellers chiefly because of the inroads that will be made on factory stocks and deliveries. It may also be pointed out that the Eastern demand has already made it a struggle for Western munitions plants to obtain tools.

The Hotpoint Electric Heating Co., Ogden Avenue and Twenty-second Street, Chicago, is contemplating the erection of a factory to cost $250,000, the site for which has not been disclosed. The headquarters of the company are in San Francisco, Cal.

George C. Nimmons & Co., architects, 122 South Michigan Avenue, Chicago, will soon award contracts for the construction of an eight-story reinforced-concrete factory, 100 x 100 ft., at Kinzie and Franklin streets, for the Union Special Machine Co., 300 West Kinzie Street.

Plans have been drawn for a one-story machine shop, 60 x 180 ft., in Maywood, Ill., for the Universal Engineering Co., maker of kerosene motors, 700 West Twenty-second Street, Chicago. The new shop will be of mill construction and cost about $15,000.

Frank D. Chase, industrial engineer, 122 South Michigan Avenue, Chicago, has awarded contracts for a one-story factory, 85 x 200 ft., in Hammond, Ind., for the Keith Railway Equipment Co., Chicago.

The American Wire Fabrics Co., 208 South La Salle Street, Chicago, is having plans prepared for a plant comprising several buildings to be built at Blue Island, Ill., at a cost of about $200,000.

The Challenge Spark Plug Co., Joliet, Ill., has been incorporated with a capital stock of $20,000 by William Hegg, C. L. E. Mueller and C. McNaughton.

The Holt Mfg. Co., Peoria, Ill., whose plans for enlargement have been referred to heretofore, has let the contract for buildings which will cover about 200,000 sq. ft. Contracts for the foundry and other buildings are yet to be awarded.

George H. Atwood, president Twin City Forge & Foundry Co., Stillwater, Minn., announces that his company has been awarded a contract for $3,000,000 worth of 6-in. shells, which will be made in its new plant.

The Murray Iron Works Co., Burlington, Iowa, has begun work on a three-story addition, 77 x 105 ft.

The Zenith Furnace Co., Duluth, Minn., will build a fireproof machine shop and storage building to cost $50,000.

The Bradford Supply Co., Robinson, Ill., will build a one-story machine shop, 40 x 60 ft.

The Great Western Smelting Co., Forty-first Street, Chicago, will build a new one-story machine shop, 100 x 100 ft., at Whiting, Ind.

The Keystone Steel & Wire Co., South Bartonville, Ill., has commenced the erection of a two-story addition, 120 x 150 ft., to cost about $35,000.

The Apex Electric Mfg. Co., Fifty-ninth Street, Chicago, manufacturer of electrical specialties, will build a one-story addition, about 25 x 50 ft.

The Ice Making Refrigerator Co., Chicago, has been incorporated in Delaware with a capital of $1,500,000 to manufacture refrigerating machinery. Fred W. Wolf, V. A. Johnson and G. W. Friend, Chicago, are the incorporators.

The Z-K Airship Co., Chicago, has been incorporated in Delaware with capital of $5,000,000 to manufacture airplanes. The incorporators are Israel Ziperstein and Michael J. Steffers, Chicago.

The Liberty Lock Mfg. Co., Chicago, has been incorporated in Delaware with a capital of $20,000, to manufacture locks. Joseph Jordan, Samuel E. Briscoe and Charles J. Evans, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Nov. 12.

Pressure upon machine-tool manufacturers, particularly those specializing in milling machines, continues to grow stronger and shops find themselves getting further behind on deliveries. An enormous number of tools is urgently needed by Government contractors and orders continue to come almost exclusively from such sources. Additional capacity is now being provided by almost every tool builder in this section. The labor situation is growing worse with respect to an increasing shortage of skilled and unskilled men. It is likely that the free employment bureaus operated by the Industrial Commission of Wisconsin will be federalized for the purposes of the present emergency. The Milwaukee office last month reported 3651 calls for help, and was able to fill 2659 positions. A year ago the orders for help numbered only 1222. Industries in the smaller communities are having a hard time, as local housing accommodations are wholly inadequate for even the present working forces and in the face of an urgent need for additional workmen, few can be induced to take positions unless assured of a place to sleep and eat. This is becoming one of the most serious phases of the labor situation.

The Eagle Mfg. Co., Appleton, Wis., manufacturer of gasoline engines, ensilage cutters and other farm machinery, has increased its capital stock from $200,000 to $500,000 to enlarge its works and to further develop its farm tractor manufacturing business. The present plant will practically be doubled in size. Frank Sauberlich is president and general manager.

The Arneson Foundry Co., Kenosha, Wis., maker of brass and iron castings, is having plans prepared by White White & White, architects, Kenosha, for enlargements and improvements to the plant.

The Menasha Wire & Mfg. Co., Menasha, Wis., has been organized by local interests to manufacture screens and other devices and supplies for paper and pulp mills. Plans are being prepared for a plant estimated to cost $30,000, including equipment. Ten wire-weaving looms will be installed.

The Klemish Co., Kewaunee, Wis., manufacturer of gasoline engines and operating a general machine-shop has disposed of its business to August Knoller, DePere, Wis., who took possession Nov. 1.

The American Grinder Mfg. Co., Milwaukee, manufacturer of tool grinders, has awarded the general contract to the Coddington Engineering Co., North Milwaukee, for the erection of a two-story shop addition, 85 x 121 ft., to cost $35,000, at Twenty-second and Sycamore streets. L. E. Bertane is vice-president and secretary.

The Topp-Stewart Tractor Co., Clintonville, Wis., which is completing work on the erection of its new plant, contemplates the construction of a hydro-electric power plant near that city. Plans have not yet been prepared but the project will mature during the winter. A. H. Mayhew is secretary.

The Superior Iron Works, Superior, Wis., has work well under way on a new brick foundry, 65 x 100 ft., at Grand Avenue and Third Street, which is being erected around the frame casting shop built 20 years ago. The capacity will be trebled.

A. J. Schutte, architect, 412 Camp Building, Milwaukee, has plans in progress for a motor truck manufacturing plant, 50 x 150 ft., two stories and part basement, to be built in North Milwaukee. The equipmetn will include a 3-ton crane. The name of the builder and occupant cannot be divulged at present.

The Denmark Condensed Milk Co., Denmark, Wis., will take bids soon for the construction and equipment of a new power plant, 40 x 60 ft.

The Cruiser Motor Car Co., Madison, Wis., will award contracts this week for the erection of the first unit of its new automobile manufacturing plant, 70 x 263 ft., at Second and Johnson streets. Completion will be specified at 90 days, so that operations may begin about Feb. 15. W. D. Curtis is president.

The Davis Mfg. Co., West Allis, Milwaukee, manufacturer of gasoline motive power units, is completing work on additions to its machine shops and foundries, the estimated cost of which is in excess of $200,000. The Davis company recently passed into the control of the Avery Co., Peoria, Ill., but it is stated that the present officers will continue in charge. Frank M. Davis is president; John T. Thompson, vice-president and superintendent, and George W. Kliegal, secretary and treasurer.

Detroit

DETROIT, Nov. 12

Prospective conversion of the motor car industry equipment to the manufacture of war materials, as now planned under Government supervision, makes necessary vast changes in the machinery and tool facilities of Detroit's most prominent industry. Dodge Bros. and the Lincoln Motors Co. factories are rapidly nearing the stage when machinery can be installed for the manufacture of war materials. Other industries throughout the State are closing large contracts with the Government for war materials. H. C. Cornelius of the Wolverine Brass Works, Grand Rapids, has obtained a contract for $400,000 worth of brass airplane parts. Representatives of Michigan industries having invested capital of $750,000,000 met in Detroit Saturday and completed plans for increasing production in all lines to aid the Government. They pledged their organizations to make their plants available for any work that may be required of them. The Ford Motor Co., Detroit, has closed a contract to manufacture 5000 Liberty motors. The plant is now carrying approximately $40,000,000 worth of Government work in addition to its regular production.

To meet the heavy demands from automobile manufacturers, the Michigan Copper & Brass Rolling Mills, Detroit, is building an addition to its plant, which will complete a unit of 160 x 1000 ft. in floor space. The new building is of brick and steel construction and will be completed about Dec. 15. It will then be possible to bring the production of the company up to 1,000,000 lb. of thin brass and copper per month. A laboratory is being added for extensive research work in testing and chemical analysis. In the interests of its employees the company is establishing a doctor's office and emergency hospital, a welfare department and lunch room. A plan of landscape gardening to beautify the surrounding grounds is also being worked out.

Cleveland

CLEVELAND, Nov. 13.

New inquiry for machine tools for Government work is extremely heavy and several round lot orders were placed the past week. The demand is largely for machinery for shell and gun-carriage work. The placing of some orders for which large inquiries are pending is contingent upon the securing of Government contracts, but it is expected that in most cases these will be forthcoming provided the required machinery can be purchased for the deliveries wanted. Little information is available regarding the requirements of Dodge Bros., Detroit, for recoil mechanism for guns, although this firm has an inquiry out for 60 planers. The Osgood Mfg. Co., Marion, Ohio, is inquiring for about 75 lathes for shell work and a Cleveland company has an inquiry out for 100 screw machines, 24 grinders and equipment for shell work. Two other local inquiries are for 10 21-in. lathes and 60 to 70 machines, including lathes, grinding, milling and drilling machines. The Government purchased considerable equipment the past week for the Rock Island Arsenal, 22 turret lathes going to a Cleveland maker. The Salisbury Wheel & Mfg

Co., Jamestown, N. Y., has placed an order with the same company for 23 turret lathes for machining gun carriage hubs and an inquiry is pending from the Interstate Motor Co., Muncie, Ind., for 15 or 30 turret lathes for similar work. The Lincoln Motors Co., Detroit, has bought some additional equipment, including lathes and radial drills. There is a heavy demand for drilling machines for work on airplane motors and motor trucks. The call for locomotive cranes for shipyards continues heavy.

Some Cleveland crane builders are preparing to bid on three 350-ton hammer-head cranes to be installed in the navy yards at Norfolk, New York and Philadelphia. Bids will be opened by the Bureau of Yards and Docks, Nov. 19, and the contract price is expected to exceed $2,000,000. The cranes will be the largest of this type ever built. The largest now in use are in European shipyards and have a capacity of 300 tons.

The Wellman-Seaver-Morgan Co., Cleveland, will shortly begin the erection of a plant in connection with its Akron, Ohio, works for the manufacture of condensers, uptakes and stacks for submarine destroyers. It has received orders for this equipment for 100 destroyers now being built by the William Cramp & Sons Ship & Engine Building Co., the New York Shipbuilding Corporation and the Newport News Shipbuilding & Dry Dock Co. The building will be of steel frame, 130 x 400 ft., and will be erected by the George A. Fuller Co. Contracts have also been placed for the equipment. Some standard lathes and drilling machines will be installed, but most of the machinery will be of a special character. It is planned to have the building ready for operation in about 60 days. The Wellman-Seaver-Morgan Co. has also taken an order for steering engines for destroyers, and work on these is under way at its present Akron plant. It is understood that both orders will aggregate close to $5,000,000. Other work includes a charging machine for the projectile plant at Charlestown, W. Va., a similar machine and two open-hearth furnaces for the Watertown Arsenal and a 75-ton hammer-head crane for the Cramp shipyards, Philadelphia.

The American Clay Machinery Co., Bucyrus, Ohio, has taken a Government order for 500,000 6-in. shells and will equip a new unit for their manufacture. It placed orders the past week for 50 21-in. lathes and is expected to buy additional machinery, including grinders and tool room equipment. It is stated that the company has under consideration the location of its new shell plant in an unoccupied factory in Mansfield, Ohio.

The Elyria Machine Co., Elyria, Ohio, has taken a Government order for shells, and the past week placed orders for 20 lathes in 21 and 25-in. sizes. Its plant will be enlarged by the erection of a steel and glass building, 60 x 200 ft.

The Parish & Bingham Co., Cleveland, will enlarge its plant by the erection of a one-story steel structure, 50 x 265 ft., for storage purposes, and a two-story building, 50 x 200 ft., of reinforced concrete, the first floor of which will be used for storage and the second floor as a tool room. The one-story building will be equipped with a 5-ton electric traveling crane. The general contract has been awarded to the W. I. Thompson & Sons Co., Cleveland.

The Balkwill Manganese Crossing Co., Cleveland, has been incorporated by Stephen Balkwill, mechanical engineer of the Cleveland Frog & Crossing Co., E. D. Rogers, T. B. Cagwin and others to place on the market a new type of railroad crossing which is designed to eliminate breakage in the bottom flangeway. The steel castings used in these crossings will consist of several small pieces bolted together instead of the usual practice of using one or two large castings. The company will issue licenses to crossing manufacturers and may later build a plant.

The Biggs-Watterson Co., machinery dealer, Cleveland, will shortly move from its present offices in the Guardian Building to 1235-37 West Ninth Street, where in addition to its offices it will maintain a storeroom for the display of both new and second-hand machinery.

The Kanter Stamping & Mfg. Co., Cleveland, has been incorporated with a capital stock of $200,000 by L. J. Kanter, A. E. Bernsteen and others.

The Paragon Machine Tool & Mfg. Co., Cleveland, has been incorporated with a capital stock of $10,000 by F. W. Treadway, Norton McGiffin, E. G. Rushforth and others.

The Cleveland Precision Tool Co., Cleveland, has been incorporated with a capital stock of $10,000 by Robert T. Snell, Harry H. Hawk and others.

The Willys-Overland Co. will erect an addition to its plant at Elyria, Ohio, at an estimated cost of $69,000.

The Lakewood-Galion Co., Galion, Ohio, has been incorporated with a capital stock of $100,000 by interests associated with the Lakewood Engineering Co., Cleveland. The latter company recently acquired the plant of the Galion Dynamic Motor Truck Co., in which it will manufacture its line of electric trucks and tractors and storage battery and trolley locomotives. The general offices of the [illegible]ation company will be located in Cleveland in connection with those of the Lakewood Engineering Co.

The Williams Foundry & Machine Co., Akron, Ohio, has placed the contract for the erection of a foundry to cost $75,000 to Clemmer & Johnson, Akron.

The Sidney Tool Co., Sidney, Ohio, has awarded the contract for the erection of a machine shop, 50 x 150 ft.

The Springfield Metallic Casket Co., Springfield, Ohio, is building a three-story addition, 80 x 190 ft., to cost about $20,000.

Indianapolis

INDIANAPOLIS, Nov. 11.

Edward Shirkie, Terre Haute, Ind., has purchased the interests of B. Frank and Ross W. Crawford in the Crawford-McCrimmon foundry and machine shops, Brazil, Ind., who have retired. C. W. Crawford, president and founder of firm, has also retired but will continue to hold an interest in the company.

The Barger Truck Co., Indianapolis, has been incorporated with $50,000 capital stock to manufacture four-wheel drive automobile trucks. The directors are Henry W. and O. Barger and Walter Brewer.

The Continental File Corporation, Anderson, Ind., has increased its capital stock from $25,000 to $100,000.

Cincinnati

CINCINNATI, Nov. 12.

Manufacturers of engineering specialties report business better than at any time heretofore. Government work practically takes up the entire capacity of plants. Orders from large lumber companies on the Pacific coast are being filled, but the volume is too great to make prompt shipments. The inability to get copper as needed is also causing some concern.

Machine tool builders are unable to quote on many inquiries now pouring in, as the matter of making shipments on time is frequently impossible. Export inquiries continue good, but in most instances shipments cannot be made on machines already completed on old contracts, as they are needed in this country by the Government. Instead of actually commandeering the machines the Government has refused export certificates in many cases. Dealers in machine tools, both new and second-hand, have lately received Government blanks to be filled out, showing not only the machines owned by them, but also all those on which they may have options, giving a brief description of each machine. Second-hand lathes from 16 in. up are hard to obtain, while boring mills are still scarcer.

The New Wapakoneta Wheel Co., Wapakoneta, Ohio, is reported to be considering enlarging its plant. Details are not yet available.

The foundry operated by William Hilland, Greensburg, Ind., has been sold to R. C. Dock, Chicago Heights, Ill. The capacity of the plant will be increased.

The National Oxygen Co., Cincinnati, A. J. Chinn, president, has removed its plant from 3240 Spring Grove Avenue to Winton Place.

The Champion Tool Works Co., V. A. Kreusberg, president, is now fitting up its new plant at Winton Place, which it expects to have in full operation soon after Jan. 1.

The Modern Foundry Co., Cincinnati, is installing equipment in an addition, 60 x 150 ft., to its foundry in Oakley suburb.

The Dayton Engineering Laboratories Co., Dayton, Ohio, has received contract for 20,000 ignition systems for airplanes. It is now operating on an 8-hr. basis to conform with Government regulations. Considerable extra equipment has recently been installed.

It is reported, but not officially confirmed, that the Domestic Engineering Co., Dayton, is having plans prepared for an addition to its plant.

The Dayton Screw Co., Dayton, W. M. Anderson, president, is increasing the capacity of its plant.

The Thomas & Armstrong Co., London, Ohio, is considering the erection of a new plant on a 2-acre site near its factory, in which will be installed equipment to more than double its present capacity. The company makes a specialty of sheet metal roofing, downspouts, etc., and also manufactures tank and farm silos.

The Monarch Machine Tool Co., Sidney, Ohio, is installing machinery in an addition to its plant that will greatly increase its present output.

The Urbana Tool & Mfg. Co., Urbana, Ohio, is moving

equipment into its new plant. It makes a specialty of dies, tools and special machine work.

The Central South

LOUISVILLE, Nov. 12.

An increased number of inquiries for equipment for garages has been noted the past week, with second-hand machines in good demand. Small wood-working plants are in the market for some replacements, and a call for ice machinery for cold storage plants is developing. New oil refineries are also contemplated. A somewhat better distribution of coal is noted.

The Wood-Mosaic Co., hardwood timber manufacturer, New Albany, Ind., has purchased a veneer plant at Huntington, W. Va., and is figuring on additional machinery to increase the capacity.

The W. P. Brown & Sons Lumber Co., Louisville, operating saw mills at Brasfield, Ark., Perth, and other points, has purchased 18,000 acres of additional timber at Brasfield and is planning the installation of an additional band mill, another resaw and log handling equipment.

The Kentucky Lithographic Stone Co., Louisville, operating a quarry at Brandenburg, Ky., will shortly be in the market for a small second-hand locomotive for hauling stone.

The John G. Duncan Co., 308 West Jackson Avenue, Knoxville, Tenn., wants jobbers' prices on prompt delivery of a 25 to 40-hp. locomotive boiler on wheels, together with a 4-in. suction steam pump with 3-in. discharge.

F. B. Moodie, president North American Fluorspar & Lead Co., Smithland, Ky., wants prices on a separating and grinding plant to be installed in a mill to cost $100,000.

The John G. Duncan Co., Knoxville, Tenn., is in the market for a second-hand steam shovel of 1¼ yards capacity, No. 20 Marion, or Bucyrus, for immediate delivery.

The Kentucky Wagon Mfg. Co., Louisville, is erecting a brick addition to its plant to take care of Government orders, and will shortly be in the market for some new equipment.

The Parkersburg Machine Co., Parkersburg, W. Va., has awarded a contract for the erection of a two-story addition to its machine shop, about 40 x 60 ft.

St. Louis

ST. LOUIS, Nov. 12.

The U. S. Auto Lock Mfg. Co., St. Louis, has been incorporated with a capital stock of $15,000 to manufacture automobile locks and other metal specialties. The stockholders are William Henckler, John C. Farrell and Clarence Graham.

The Choctaw Portland Cement Co., Hartshorne, Okla., will increase its capital from $750,000 to $1,250,000 to increase its capacity.

The Knobel Gin Co., Knobel, Ark., R. V. Harper, H. Whitaker and James L. Smith interested, is reported in the market for about $10,000 worth of cotton ginning machinery.

The Churchill Compress Co., Clarksdale, Miss., will enlarge its plant and add machinery to increase its capacity about 100 per cent.

F. S. Evans and Will Davis, owners of a cotton gin burned at Greenwood, Miss., are reported in the market for about $7,500 worth of new machinery.

The Nicholls Pump & Well Co., Stuttgart, Ark., has been incorporated with a capital stock of $50,000 by J. P. Nicholls, H. C. Duckett and H. C. Hollis to establish a machine shop and foundry.

The Tropic Ice Machine Co., Oklahoma City, Okla., E. J. Green president, is in the market for a 12-in. pipe machine and an 18-in. x 12-ft. lathe.

The Delta Mining Co., Kennedy Building, Tulsa, Okla., W. E. Templeman, president, is in the market for boilers, concentrating mill equipment, engines and other machinery.

Kansas City, Mo., will install a garbage incinerator to cost about $130,000.

The Fire and Water Board, Kansas City, will build an additional pumping station to cost about $500,000.

Okmulgee, Okla., will issue $385,000 in bonds for additional waterworks equipment. R. H. Jenness, commissioner of finance, is in charge.

J. D. Johnson, 420 Johnson Street, Little Rock, Ark., is reported in the market for concrete-mixing machinery, hoisting machinery and other equipment.

C. M. Huber, Crystal Springs, Miss., is in the market for machinery for the manufacture of fertilizer from acid phosphate, cotton seed meal, etc.

The Perfection Mattress & Spring Co., Birmingham, Ala., is planning to equip a section of its works for the manufacture of wire clothes hangers.

Texas

AUSTIN, Nov. 10.

The machinery and tool trades continue active with the demand for irrigation equipment larger than ever before known. A renewal of disturbances in different parts of Mexico is causing a curtailment of orders from that country.

The Fabrica de Automovilles, Monterey, Mexico, has been incorporated with a capital stock of 600,000 pesos which is equivalent to about $300,000 gold. It is having plans prepared for a plant to manufacture automobiles.

The Beaumont Iron Works, Beaumont, will soon install additional machinery and other equipment, including electric transformers.

H. Hagedorn and associates, Waco, have incorporated the Guaranteed Vulcanizing Co. and will install equipment for general automobile repair work.

The Oil Machine & Mfg. Co., Fort Worth, has been incorporated with a capital stock of $50,000 to manufacture certain lines of machinery. J. W. Carter is a stockholder.

California

LOS ANGELES, Nov. 6.

George L. Craig, Craig Shipbuilding Co., Long Beach, Cal., is planning for the construction of new shipbuilding works near the municipal pier, San Diego, estimated to cost about $500,000.

The Perfection Machine & Tool Works, 1568 East Twenty-second Street, Los Angeles, has been organized to operate a machine shop and tool works. G. O. Hix and Henry Garbe head the company.

The Moreland Truck Co., Los Angeles, manufacturer of motor trucks, will build a one-story addition, 40 x 100 ft., to its foundry at its new plant now in course of construction at Burbank.

The D. & B. Pump & Supply Co., 2625 Humboldt Street, Los Angeles, manufacturer of pumps, etc., has increased its capital from $70,000 to $250,000.

The Ventura Mfg. Co., Ventura, manufacturer of agricultural implements, is considering the removal of its works to a new site with increased capacity. Property near Torrance is now being selected for the new plant.

The Tractor-Train Co., 1346 Wall Street, Los Angeles, has been organized to operate a machine shop and tractor manufacturing plant. Frank E. Eckhart, 501 South Kingsley Drive, heads the company.

James Guitar, Calexico, is planning for the erection of a new cotton gin of about 100 hp. for initial operations.

The Central Machinery Mfg. Co., Los Angeles, will erect a new one-story building, 40 x 125 ft., on San Pedro Street, near Sixteenth Street.

The Cain-Housman Mfg. Co., 5217 Moneta Avenue, Los Angeles, has been organized to manufacture gas radiators, etc. W. H. Cain and W. B. Housman head the company.

The Pacific Northwest

SEATTLE, WASH., Nov. 6.

The final settlement of labor disputes in the shipbuilding industry of this section is expected to be followed by heavy demands for marine engines and parts as well as for machinery and machine tools for making marine specialties. Some extensions to machine shops are under way and many are planned. Notwithstanding the season the demand for machinery from lumber mills keeps up.

Thomas Bilyeu and associates, Portland, have plans completed for a foundry and machine shop, 90 x 110 ft., to be erected at Astoria. Negotiations are under way for a lease on the Astoria water front on which to erect a ship repair and marine machinery manufacturing plant.

The Puget Sound Traction, Light & Power Co., Seattle, will erect a coal pulverizing plant at its Western Avenue power station to cost $80,000.

A. H. Cox & Co., Seattle, who handle lumber mill machinery and supplies, have secured space on Eyers Dock on which heavy machinery will be carried, and has doubled the capacity of its store space on First Avenue, South.

The Martinolich Shipbuilding Co., Seattle, has been incorporated by John Martinolich and C. E. Papst, and will construct a plant at Quartermaster Harbor for building wooden steamships for Norwegian interests. It is stated that contracts for four vessels have been taken.

The National Steel Construction Co., 425 Frontenac Street, Seattle, will construct a boat building shed, 60 x 288 ft., to cost $5,000.

George Mockley, 3901 Ninth Avenue, South, Seattle, is having plans prepared for a frame foundry, 60 x 80 ft., to cost $3,000, exclusive of machinery and equipment.

The Puget Sound Spar Co., Seattle, has purchased a 5-acre tract across Lake Washington, on which a plant will be erected for the manufacture of spars, booms and masts. O. B. Hollis, manager, states that enough orders have been booked to keep the plant in operation for a year with two shifts of men.

W. H. Jewett, Gardiner, Ore., whose sawmill was destroyed by fire a year ago, plans to immediately construct a new mill to have a daily capacity of 70,000 ft.

The Astoria Marine Iron Works, Astoria, Ore., has been incorporated and plans the establishment of a machine shop and foundry, 90 x 110 ft., for the manufacture of ship machinery and steel fittings and to repair vessels.

The Star Machinery Co., Seattle, manufacturer of rebuilt machinery and saw and shingle mill equipment, contemplates the construction of a two-story concrete addition, 120 x 148 ft., to its plant at 1731 First Avenue, South, to be used as a machine shop and sales room.

The Elliott Bay Shipbuilding Co., Seattle, plans the construction of a shipbuilding shed, 280 x 320 ft., providing five shipways and costing $35,000. This will immediately be followed by the erection of an office building, foundry, plate shed and machine shops, to cost $135,000.

The Burbank Machinery Co., Seattle, will change its name to the Pacific Derrick & Hoist Co.

The Seattle Can Company, Seattle, will remodel an acquired building at Georgetown into a can and box manufacturing plant. Considerable new equipment will be installed.

The Pacific Construction & Engineering Co., 2719 Whatcom Avenue, Seattle, contemplates extensions to its plant to increase the capacity more than 25 per cent. A 90-ft. addition will be built and equipped with new machinery. It manufactures heavy forgings for shipbuilding and engine plants. Robert C. Monteagle is president.

Libby, McNeil & Libby, Seattle, have let a contract for a two-story machine shop, 40 x 70 ft., to cost $5,000.

The Baker White Pine Lumber Co., Baker, Ore., contemplates the construction of a sawmill to cost $175,000 and to have a daily capacity of 160,000 ft.

Canada

TORONTO, ONT., Nov. 12.

The Canadian Allis-Chalmers Co., Ltd., King and Simcoe streets, Toronto, is making additions and repairs to its shipbuilding plant at Bridgeburg, Ont., and installing new machinery.

The Essex Tractor Co., Essex, Ont., will build a concrete and brick factory to cost $10,000.

The Bawden Machine Co., 163 Sterling Road, Toronto, has commenced work on the erection of an addition to cost $5,000.

The United Rubber Mfg. & Reclaiming Co., 495 Yonge Street, Toronto, is making arrangements for the erection of a factory at Whitby, Ont., to cost $15,000. The Jackson-Lewis Co., Bell Telephone Building, Toronto, is the architect.

Lethbridge, Alta., proposes to install power plant equipment to cost $65,000. W. A. Stephens is clerk.

Isaac Stewart and Leon Cook, Georgetown, Ont., are preparing plans for a factory for the manufacture of needles, etc., to cost $10,000.

The Russell Motor Car Co., Ltd., King and Duncan streets, Toronto, is in the market for vertical boring mills, 50 to 60 in. swing; horizontal boring mills, 3 to 6 in. boring bar; hobbing machine, for cutting worm wheels 42 in. in diameter, and 60 in., Brown & Sharpe spur gear cutter.

The Canadian General Electric Co., Toronto, has taken a contract through the Imperial Munitions Board, Ottawa, to build four ocean steamships of 3500 tons each. The hulls will be constructed at the Bridgeburg, Ont., plant of the company and the engines, boilers and accessories will be built at the Davenport works in Toronto.

The forging plant of the Cluff Brothers Ammunition Co., 28 Atlantic Avenue, Toronto, was totally destroyed by fire Nov. 3, with a loss of $200,000. The fire also caused considerable damage to the buildings of the Ontario Wing Engine and Pump Co. R. J. Cluff, head of the Cluff company, states that the plant will be rebuilt immediately at a cost of $20,000. New machinery will be required. This is the second fire to visit the works of the Cluff company within a year.

The Nash Motor Sales, Ltd., Toronto, has been incorporated with a capital stock of $200,000 by Henry Horsman, Frederick B. Edmunds, 1758 Dundas Street; William H. McDonald and others to manufacture automobiles, motorcycles, engines, motors, etc.

The Lee Puncture-Proof Tire Co. of Canada, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Albert A. Garthwaite, Conshohocken, Pa.; John M. Dettra, Morristown, Pa.; William P. McFeat and others of Montreal to manufacture tires and other rubber goods.

The Transparent Rubber Goods Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Willis B. Sturrup, 6 Adelaide Street, East; Thomas S. H. Giles, 249½ St. Helen Avenue; John S. Duggan and others to manufacture rubber goods.

Safe on Sea, Ltd., Montreal, has been incorporated with a capital stock of $1,000,000 by Rene Chenevert, Leopold Barry, both of Montreal; Dennis McA. Coughlin, Westmount, Que., and others to manufacture life-saving devices, rubber goods, etc.

The Davis-Durkin Corporation of Canada, Ltd., Trenton, Ont., has been incorporated with a capital stock of $100,000 by Gordon D. Oulster, William Brown, John G. McHattie and others, all of Ottawa, to manufacture explosives, tools, shells, etc.

The George C. Brymer Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by George C. Brymer, 115 King Street, East; Percy G. A. Webster, Charles B. Nasmith and others to manufacture jewelry, clocks, watches, chains, etc.

Catalogs Wanted

A. J. Papineau, architect, P. O. Box 1896, Winnipeg, desires catalogs and information on building material, equipment and power apparatus for an abattoir and cold storage plant.

Government Purchases

WASHINGTON, Nov. 12.

Bids will be received by the Bureau of Yards and Docks, Navy Department, Washington, until Nov. 26 under specification 2666 for furnishing at Norfolk, Philadelphia and New York dry dock cranes. Also, sealed proposals, indorsed proposals for fitting-out cranes will be received until Nov. 19 for three electrically-operated fitting-out cranes of 350 gross tons capacity at the Norfolk, New York and League Island navy yards. Drawings and specification No. 2587 may be obtained on application to the bureau or to the commandants of the navy yards named.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on Nov. 2 for furnishing materials and supplies for the naval service as follows:

Schedule 2014½; class 1. Boring and turning mill—Bid 58, $12,465. Alternate—Bid 39, $13,300; 58, $11,280.

Schedule 2086½; ordnance, class 61. South Charleston, W. Va.—Two 54-in. triple-geared variable-speed heavy-duty boring and turning lathes—Bid 58, $23,810; 26, $18,200; 35, $15,252.

Names of the bidders and the numbers by which they are designated in the above list follow:

Bid 26, Houston, Stanwood & Gamble Co., Cincinnati; 39, Kemp Machinery Co., 223 North Calvert Street, Baltimore; 35, I. H. Johnson, Jr. & Co., Inc., Philadelphia; 58, Niles-Bement-Pond Co., New York.

The Bureau of Census, Department of Commerce, has published a report on the 1914 census of manufactures, giving figures on the American machinery production, including machine tools and other metal working machinery. Machine tools were the largest, according to value of product, and Ohio was the leading state in the production of this class of machinery, with products constituting more than one-fourth of the total reported for all states combined. Rhode Island ranked second, Connecticut third and Massachusetts fourth. In the manufacture of metal-working machinery other than machine tools Pennsylvania was the leading state in the value of output, New York ranking second, Ohio third and Connecticut fourth. The four states combined contributed nearly three-fourths of the total value of products.

W. W. Lindsay & Co., Harrison Building, Philadelphia, have incorporated their business of steel construction, open-hearth and heating furnaces, steel plate work, etc., and will in the future be known as W. W. Lindsay & Co., Inc.